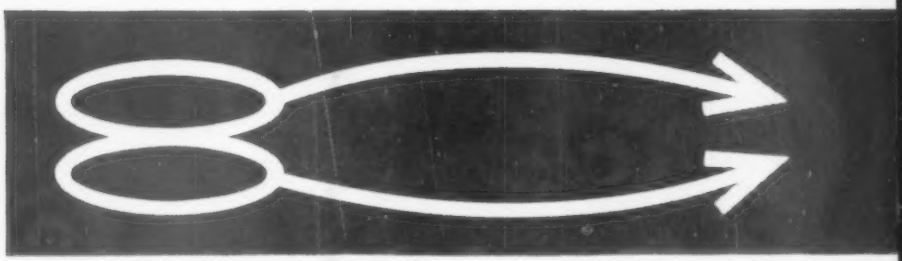
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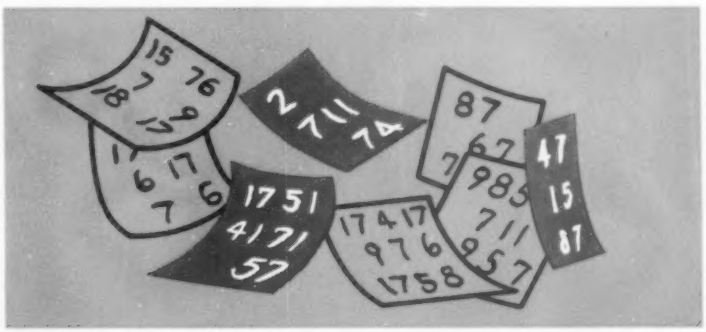
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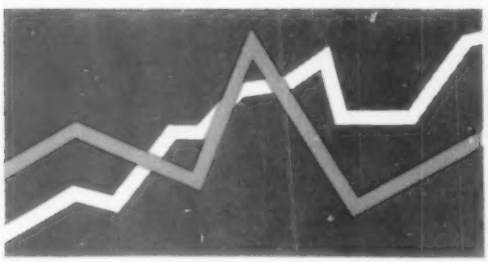


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A CONOVER-MAST PUBLICATION SEVENTY-FIVE CENTS

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Wherever in the world your hydraulic machinery operates . . .

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- **Shell Macoma Oils**—for extreme pressure industrial gear lubrication
- **Shell Voluta Oils**—for high-speed quenching with maximum stability

Around the world, Shell Tellus Oil is available—under the same brand name and providing the same performance that your domestic customers rely upon.

Tellus® Oil is top-rated as both a lubricant and control fluid for complex hydraulic systems. Its ability to combat oxidation, rust, sludge formation, wear and foaming has earned it world-wide popularity.

No matter where your hydraulic machinery is shipped, make Shell Tellus Oil your standard recommendation. Write for complete information.



AN INTERESTING FACT!
Every Shell Branded Industrial Lubricant is named for a sea shell. Shown here is the **Cultellus** costatus.

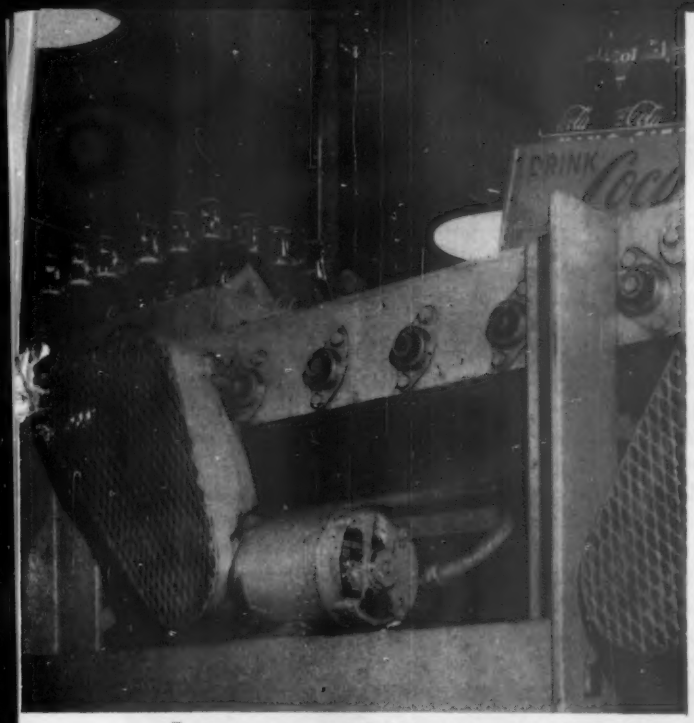
SHELL OIL COMPANY

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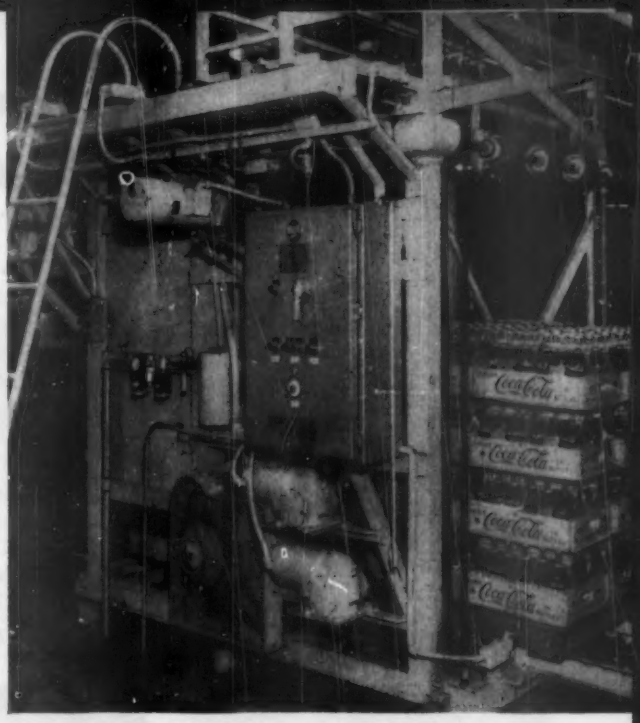
SHELL

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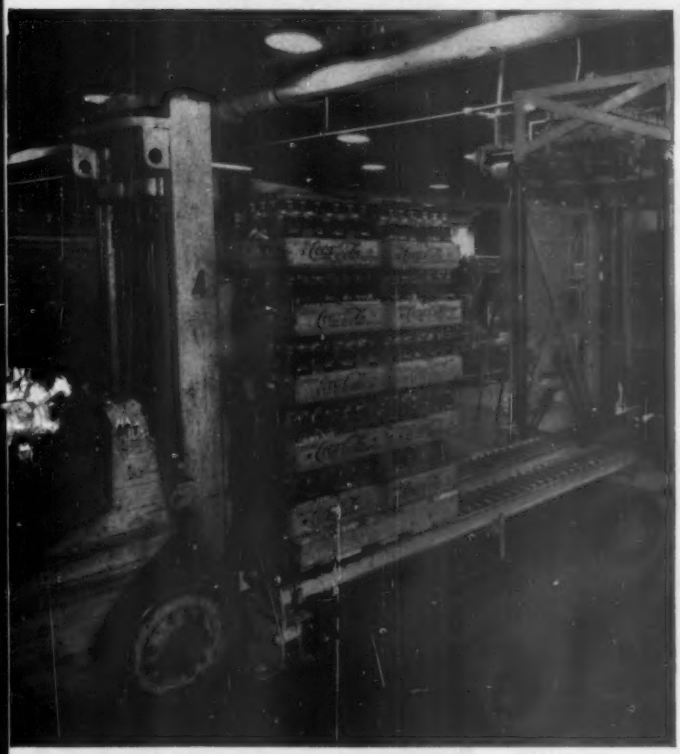
For More Facts About Ad on Facing Page Write in No. 154→



1 Century's compact IR 48-frame gearmotor driving live roll conveyor to the top of pallet loader.



2 A Century 1R64 SC64 gearmotor with brake (in upper left of picture) raises and lowers pallets from empty pallet conveyor to loaded pallet conveyor.



3 Loaded pallets being picked up by lift truck. Century 1R66 SC66, ¾ horsepower gearmotors drive empty and loaded pallet conveyors.

Century gearmotors load, stack and convey thousands of soft drinks per day

Century Electric's single-reduction, right-angle gearmotors are built right into the versatile pallet loader shown here. Thousands of bottles of soft drinks a day are conveyed, stacked, loaded onto pallets and conveyed to fork lift trucks by Century's gearmotors.

Century gearmotors, with silicon bronze worm gears and hardened high-grade steel worms, are designed and built to withstand sudden shocks and overloads in applications such as this pallet loader. Motor shafts are not affected by operational strains because mounting feet are an integral part of the housing (except the IR 48-frame). Also, motor shafts are carried on ball bearings and output shafts run in tapered roller bearings to withstand sudden shocks.

All-angle oiling design assures complete lubrication. Worms or worm gears dip into oil, no matter how the gearmotors are mounted.

The gearhead on the IR 48-frame gearmotor (Picture No. 1) can be assembled in four different positions in relation to the motor, and the motor can be mounted at any angle. The new 1R 48-frame gearmotor is also very compact. With it you can reduce the weight of your product by as much as 20 pounds.

For more information about Century's complete gearmotor line from ⅛ to 125 horsepower, call your nearest Century Sales Office.

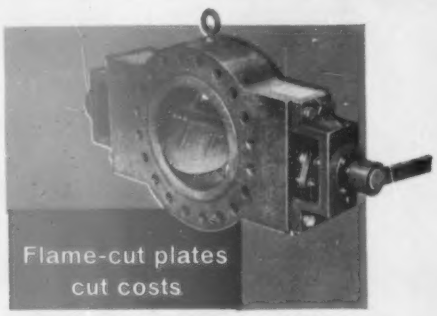
CENTURY ELECTRIC COMPANY

St. Louis 3, Missouri *Offices and Stock Points in Principal Cities*

Century

60-2

METALOGICS* IN



HIGH REJECTS: Use of flat steel castings for valve bodies, with I. D. ranging from 4" to 60", accounted for increases in costs for this manufacturer. Pattern costs rose because of numerous changes . . . rejects were high due to porosity and other casting faults that showed up only after machining.

HIGH QUALITY: Ryerson recommended using flame-cut plates ranging in thickness from 1" to 8". Results: greater production flexibility, faster delivery, lower cost and a stronger product for this high-pressure service. Tight Ryerson quality control delivered plates of exceptionally clean surface to exact thickness of finished product, requiring little machining.



PLATES REQUESTED: Ryerson was asked to bid on supplying ¼" Type 410 stainless in 27½" square plates. Material was to be used for orifice plates for 16" burner, subjected to elevated temperatures.

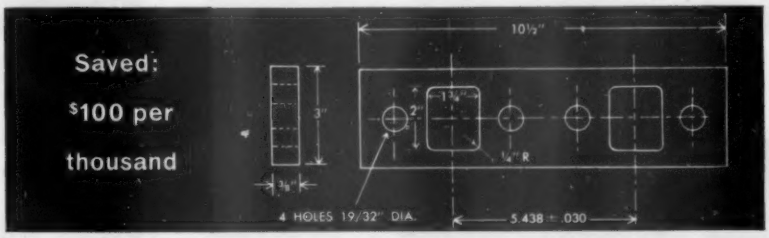
RINGS RECOMMENDED: Going beyond material specs, the Ryerson representative found that the customer intended to cut plate into 27⅛"-diameter rings with 13.120" bore—and then mill 12 slots in outer diameter for expansion relief. Knowing the application, Ryerson recommended supplying machine-cut rings in which slots could then be punched rather than milled. Production savings enabled switching to Type 304 at less cost than Type 410 with slots milled.

Look at these random examples and see how Ryerson Metalogics sparks real savings by continually searching for and suggesting new materials, methods and techniques.

The broadest experience anywhere combines with the widest range of stocks available to offer you unbiased recommendations on the best material for any job—be it steel, aluminum or plastics. Always the right metal-fabricating machine, too—for Ryerson is the nation's largest distributor.

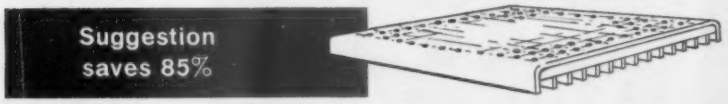
Your Ryerson representative is "Metalogics-trained" to help you *value-analyze* selection, fabrication and application problems. Get his constructive ideas soon, and see how he can help you select and apply material from our vast stocks. It's the "Metalogical" thing to do.

**The Ryerson science of giving optimum value for every purchasing dollar.*



PROBLEM: Muffler manufacturer required accurately finished mounting plates made from ⅜" x 3" bar. Cutting bars to size, burning 1¾" x 2" holes and drilling four 19/32" holes proved time-consuming and expensive.

SOLUTION: Ryerson recommended that they eliminate cutting, burning and drilling operations by stamping the part from Ryerson forming-quality plate. One operation instead of three cut costs $100.00 per thousand pieces and quickly justified the small initial investment in dies.



ASKED FOR: Customer wanted 1" hot rolled plate to cover about 80' of 24" open trench. Plate was to be cut into 24" x 27" segments—each containing 900 ⅜" holes to filter the product.

RECOMMENDED: After studying application and cost, Ryerson recommended a design combining perforated light plate, formed to channel shape, and grating for structural support. Ryerson experience and imagination saved 85% of the original cost.

Soft touch on fabricating sheets

THE NEED: Cold rolled sheets that would take severe forming and retain smooth, dull surface for high lacquer finish. Sheet quality was found on inspection to vary widely from one shipment to the next, causing variations in forming and finishing operations . . . high reject rate.

THE ANSWER: The Ryerson representative showed how our stringent quality controls would assure consistent quality on every shipment so that forming and finishing could be standardized for better results . . . lower production cost figures.



ACTION



BEFORE: Job shop was using MT 1015 tubing in the manufacture of this coupling. Machinability was satisfactory, but rising costs of operation led to a search for ways to economize.

AFTER: Careful study by the Ryerson representative brought about a change in material. He recommended using Ledloy® 170 tubing, which increased machining speed to 170 s.f.m. and stepped up production 30%. Ryerson's stocks include the widest range of fast machining alloys—types and sizes to fit your every need.

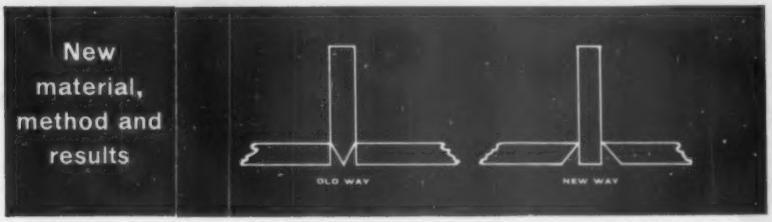


OLD WAY: A screw machine shop used nylon in the manufacture of nipple adapter and coupling nuts—until a Ryerson representative came on the scene.

NEW WAY: At his suggestion, they changed to Ryertex-Omicron PVC—cut costs 50%. PVC machined better—to closer tolerances, with improved finish . . . ran faster without "gumming." Note exact cutting of threads and barbs. Threads fit perfectly.



SEARCH: Complicated machining of a carbide grade gear shaft included cuts up to ½". It was discovered that required machining was too slow with the steel chosen for the job.
ANSWER: Rycut® 40 was recommended by the Ryerson representative. This free machining alloy fit the situation perfectly. The company found that Rycut 40 machined at 250 s.f.m., gave a better finish, increased tool life, and lowered total per-piece cost. An alloy in the Rycut series may well lower your costs.



OLD: Rows of vertical aluminum grid members were attached to an aluminum base plate by notching the grid members and welding. (2024-T3 aluminum plate was used.) However, upon cooling, welds fractured—causing a high reject rate on this assembly.
NEW: A Ryerson representative suggested undercutting the base plate (as shown) instead of the grid members. This exposed a greater area to heat and permitted a larger deposit of weld material. Another Ryerson suggestion: change material to 5052-H34 aluminum, which responds better to welding operations.



5-DAY LIFE: The sheaves that guide the enormous digging buckets of underwater dredges take a very severe load. Bronze bearing in the sheaves had to be replaced every four or five days.

5 MONTHS, SO FAR: After discussing the problem with a Ryerson man, the chief engineer decided to try a bearing made of Ryertex. The change was made, and five months later hardly any wear was noticeable! With its low friction coefficient, Ryertex is nonbinding, even on itself.

2 metalworking machines for the price of 1

A fabricator of stainless steel kitchen equipment was recently in the market for a new squaring shear. The one under consideration had a gap-type frame which would enable him to do an important notching operation—necessary for certain sink tops. After careful study, a Ryerson machinery specialist recommended *two* pieces of equipment instead of one at no increase in total cost. The first, an underdriven shear. The second, a universal-type sheet metalworking machine that would do the required notching, plus many other jobs—adding versatility to the entire operation.

PRODUCTS IN STOCK

STEEL—carbon, alloy, and stainless steel—bars, structurals, plates, sheets and strip, tubing, etc.

ALUMINUM—sheet (including new building sheet), plate, coils, rod and bar, tubing and pipe, building products, etc.

INDUSTRIAL PLASTICS—Ryertex-Omicron PVC in all forms. Also Ryertex® laminated phenolic plastics for bearings.

METALWORKING MACHINERY—the broadest line available from a single source for every kind of metal fabrication. Also specialized line of material handling equipment.

METALOGICS
RYERSON PLUS VALUES

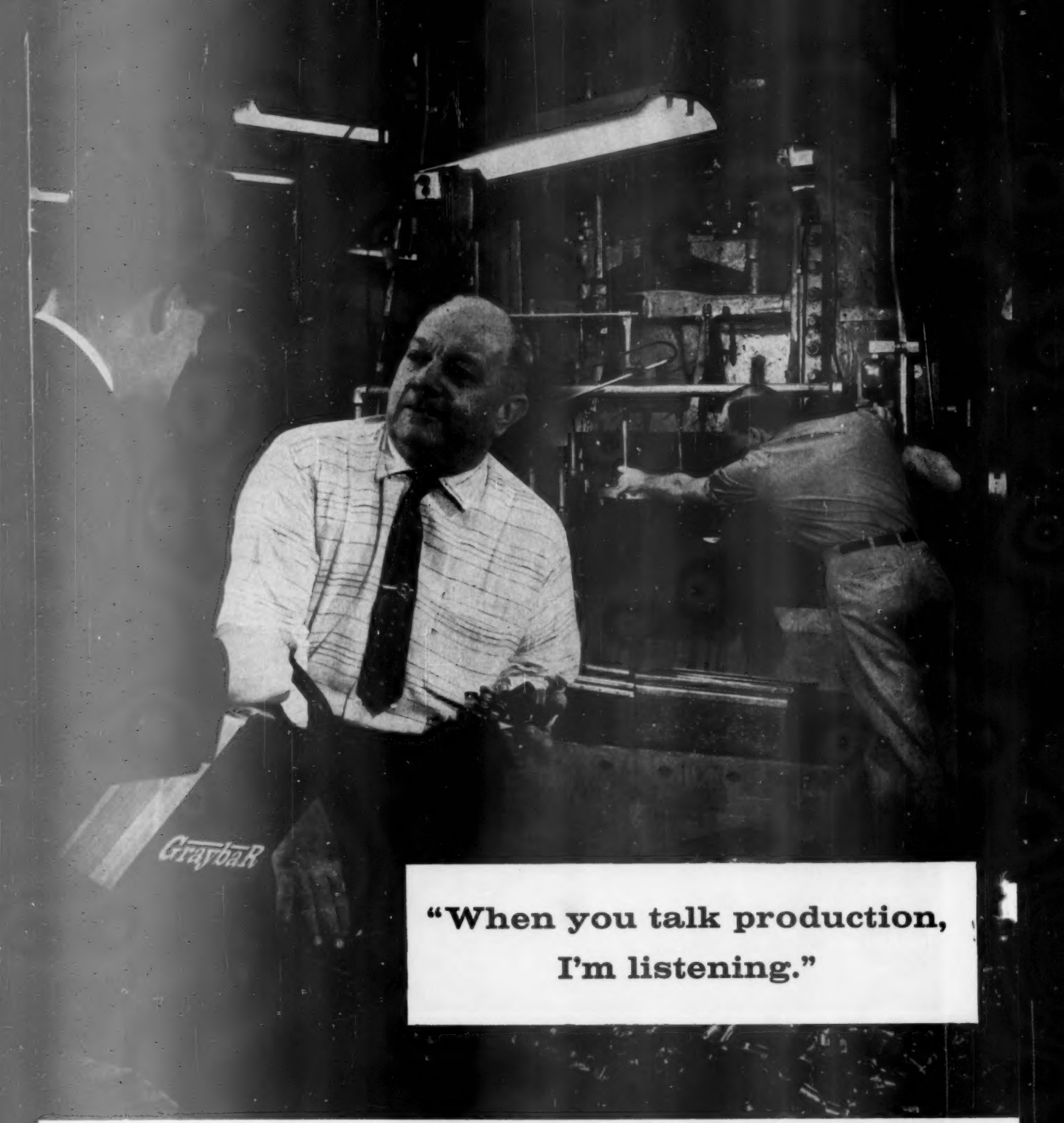
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"When you talk production, I'm listening."

First things first . . . production's the subject when the Graybar man sees the production supervisor. This is why electrical equipment the Graybar man recommends, . . . and the know-how he gives, help keep production rolling.

Graybar is *the* leading independent electrical distributor. Next time . . . call Graybar. We'll work with you or your electrical contractor. ❞

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PURCHASING

The Methods and News Magazine For Industrial Buyers

DECEMBER 5, 1960
VOLUME 49, No. 12

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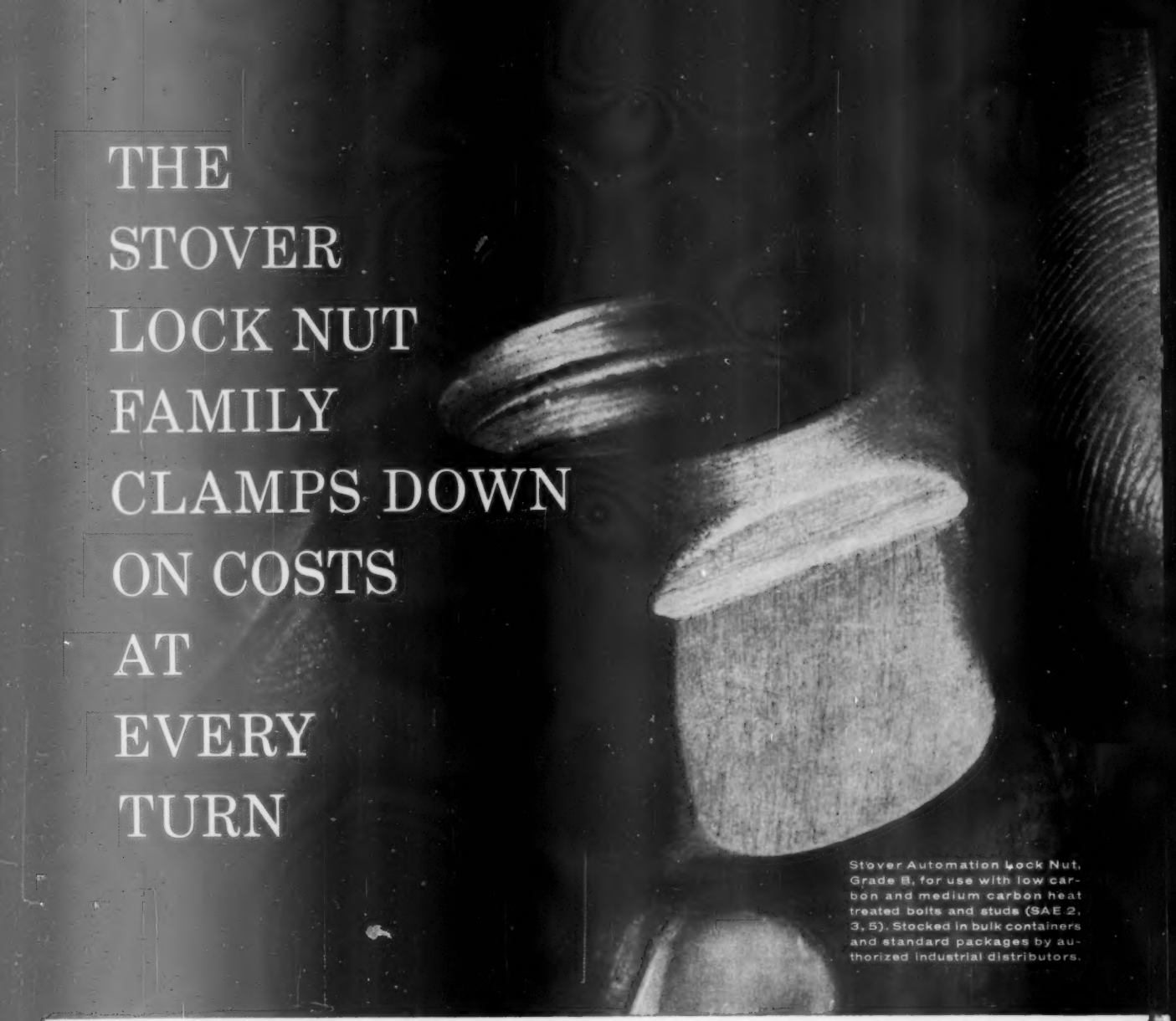
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Stover Automation Lock Nut, Grade B, for use with low carbon and medium carbon heat treated bolts and studs (SAE 2, 3, 5). Stocked in bulk containers and standard packages by authorized industrial distributors.

Don't let the simple appearance fool you: Stover Lock Nuts take 25% less tightening torque to reach required clamping loads than common nuts or competitive lock nuts. This means you can use smaller, lighter driving tools. Yet Stover Lock Nuts won't back off by themselves—seated or unseated. Moreover, they start like common nuts, run up smoothly without galling or seizing, can be hand or hopper fed, and are fully reusable.

Car and tractor makers, for example, used about 80 million Stover Lock Nuts last year. The money these companies saved in *either* purchasing, assembly, or service-in-the-warranty-period easily paid for the lock nuts' initial cost. Value—in spades!

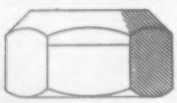
Stover Lock Nuts cost a little more than common nuts, but are very competitive with other lock nuts. They're available in bulk, with the popular styles also available through industrial distributors. Write us for the name of your nearest distributor, samples, or the just-published Stover Engineering Manual.

LAMSON & SESSIONS

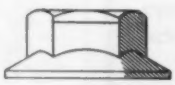
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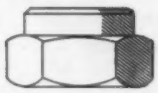
Automation
¼"– 1"
A basic nut for general use.



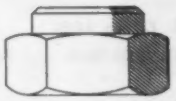
Flange
#8 – ½"
For clamping soft and/or thin materials.



Thin Hex Collar
¼"– 1½"
Used where space is a problem, such as on pinion and pulley shafts.



Hex Collar
⅞"– 2"
Lower on-torque in the larger sizes than Automation style.



Heavy Hex Collar
⅞"– 2"
Used where greater bearing surface is needed than available with Hex Collar style.

Slow 1st Half, Upturn in 2nd

THE business outlook for 1961 can best be divided into two phases: continuation of steady conditions during the first six months (with perhaps some minor dips) and a sharp upturn in the second half.

Until somewhere around July 1961, we can probably count on about the same level of business that we have right now. By then, the economy will be primed for a pickup in business activity—which should partially arise from the demand backlog built up during the previous slow period.

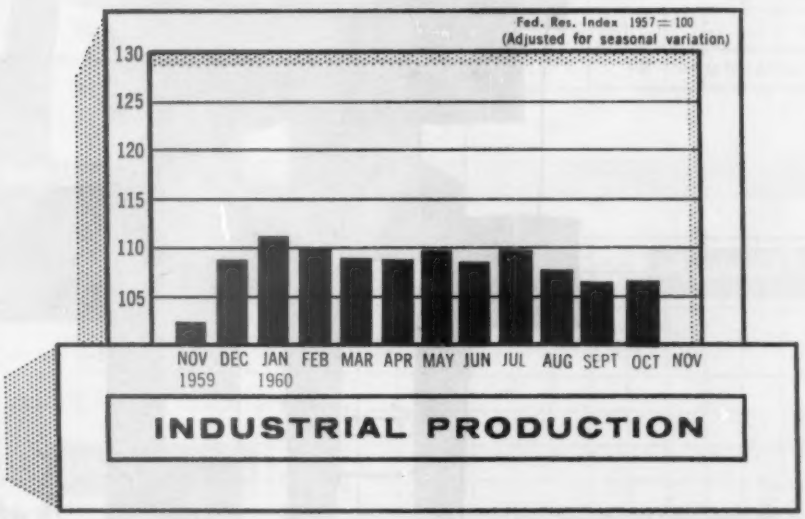
One important point to remember, however—the current level of business activity is not "bad" (see "The Economy: Which Way Are We Headed?", page 76). Even though business now is not at the high levels of ten or eleven months ago, the percentage of decline since then has been relatively small.

Profit Squeeze Gets Tighter

During 1960, the profit squeeze became even greater. For instance, during the first half of the year, sales of all manufacturing corporations were 3% higher than the similar period of 1959. But profits in the same six months were down 7%. And net income per dollar of sales, which represents the margin of profit, declined to 4.6 cents in the first six months of 1960 from 5.1 cents in the first half of the previous year.

While nine-month figures are not complete yet, indications are that the situation has not changed appreciably. In a survey made by the Cleveland Trust Company of 210 large manufacturing corporations, 61% report higher sales for the first three quarters of 1960, compared to the same period of 1959. But 60% report lower profits and 71% say that their profit margin has been reduced.

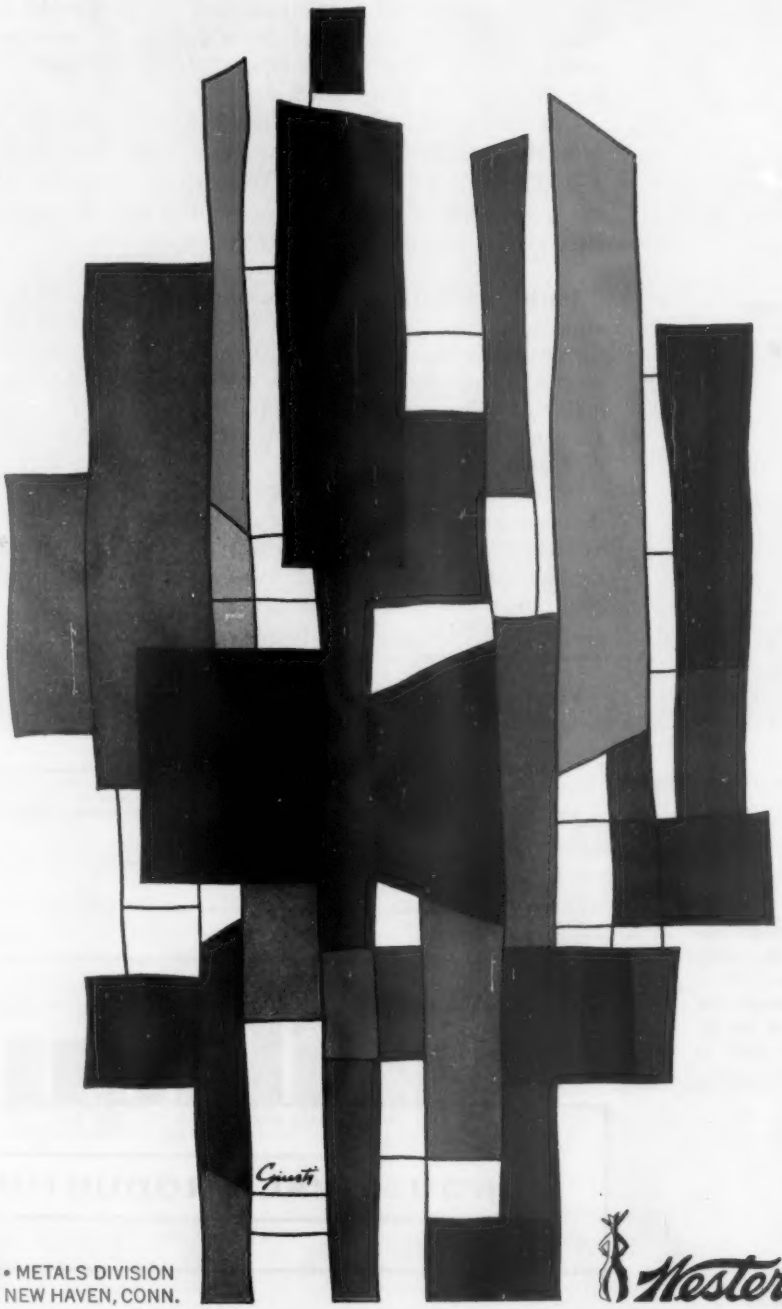
For the future, one of the brightest spots is construction. Even



The FRB's Industrial Production Index was steady at 107 in October (1957=100). This is about 3% below the level of the index in the first half of 1960.

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You'll get modern styling, ageless appeal, with Western Brass . . . for the enduring glow of solid brass adds a classic note to contemporary design . . . keeps any design forever young and beautiful. That glow is kindled at Western Brass by meticulous finishing and packing methods, unexcelled in the industry. Moreover, this precision finishing, customers say, actually gives more parts per pound of sheet or strip. You'll make it better with beauty-rich brass. You'll make it best with "tailor-made" Western Brass.



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Western BRASS

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during the first half of 1961—when overall business conditions may not be too favorable—construction contracts are likely to show a slight increase.

Construction contracts next year will total about $35.8 billion, predicts F.W. Dodge Corporation. This is a gain of 1% above the estimated 1960 level and could make 1961 the second highest year on record.

Public projects, which account for over a third of the total, are expected to show strength next year. However, most of the increase will probably come in contracts for heavy engineering construction—public works and utilities.

Of course, the area of construction that's most in the public eye is housing starts. Although 1960 has been somewhat disappointing, the outlook for next year is better.

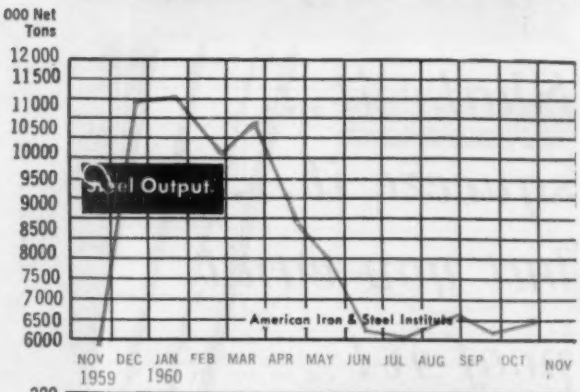
The Department of Commerce predicts 1.3 million housing starts next year compared to this year's scaled-down target of 1,250,000 starts. In 1959, however, housing starts came to a near-record total of 1,553,000 units.

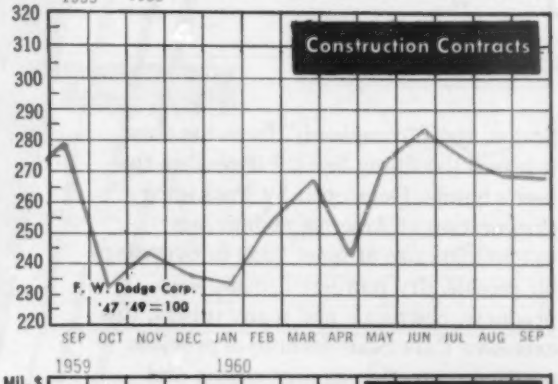
This expected pickup, based on a strong recovery in the second half of the year, will stem from a greater availability of mortgage credit. A trend towards easier credit has been noticeable for some months now.

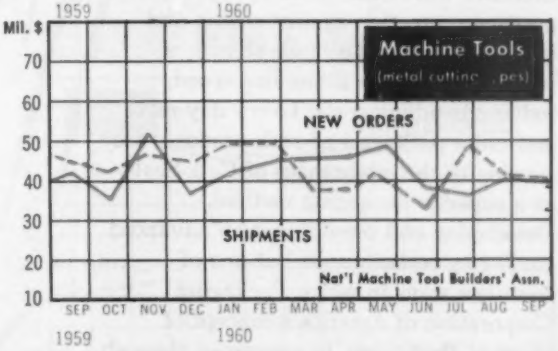
There is, however, a construction category that showed sharp gains in 1960 which is expected to have less steam in 1961. That's the area of industrial construction.

Private outlays for industrial buildings are

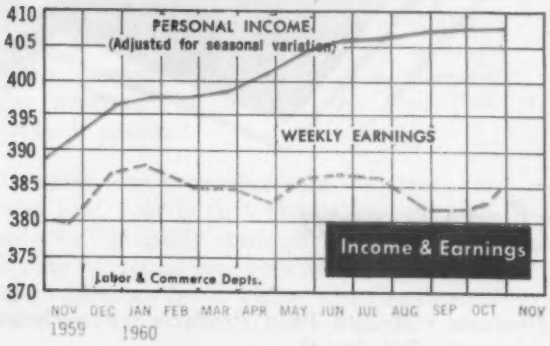
PRODUCTION

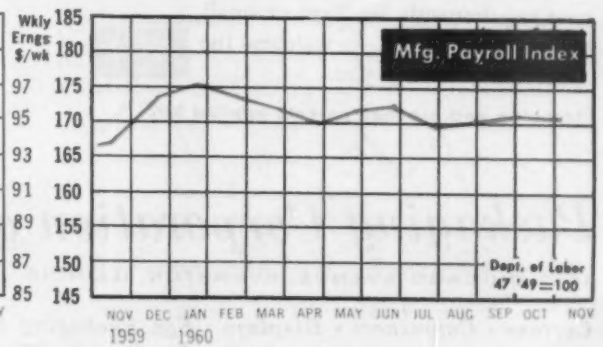






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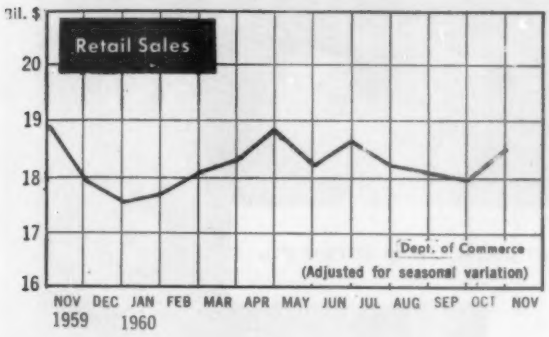
*Machine and process patents applied for.

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expected to hit $2.9 billion in 1960, 38% above last year. An additional gain of only 7% is projected for 1961 by the Commerce Department. Why? "Indications of a reduction in business profits," it says.

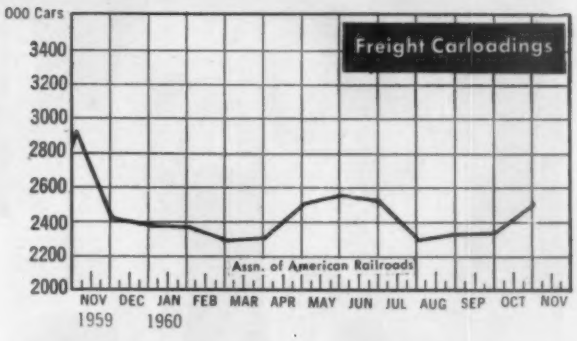
In contrast to construction, the 1961 outlook for the steel industry looks dim. The current operating rate for the nation's steel mills of around 50% is expected to continue on into the beginning of 1961.

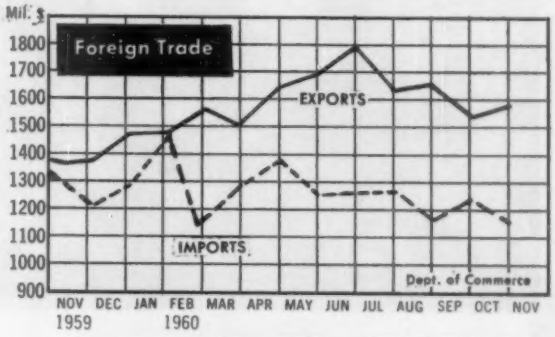
At this rate, steel consumption next year could be even lower than 1960's depressed level. Steel production this year is estimated at about 100 million tons.

One factor that could affect the amount of steel usage in 1961 is the future plans of the automobile industry. Increasing use of aluminum and other materials is displacing steel in many automobile applications.

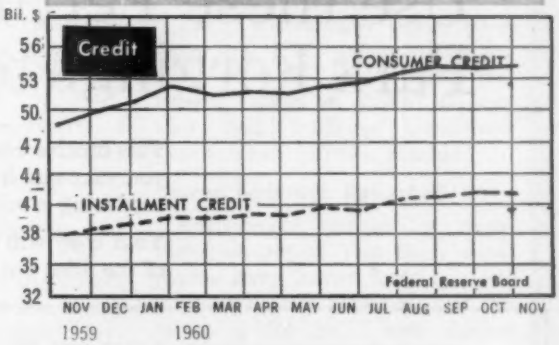
According to William T. Steele, president of Wheeling Steel Corporation, "The automotive industry may use 10% to 15% less steel next year than in 1960." This could happen, he says, "if, as frequently predicted, a somewhat smaller number of vehicles is produced and a larger share of passenger car output is in 'compact' types which use about 25% less steel than 'standard' models."

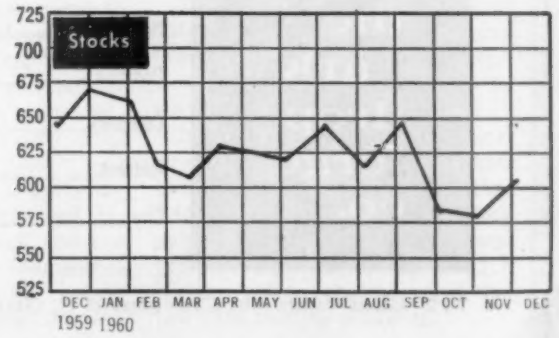
However, one promising sign for steel companies next year is that production and shipments will probably conform more closely to the pace of actual consumption than in 1960. This could mean fewer violent changes in steel output figures.

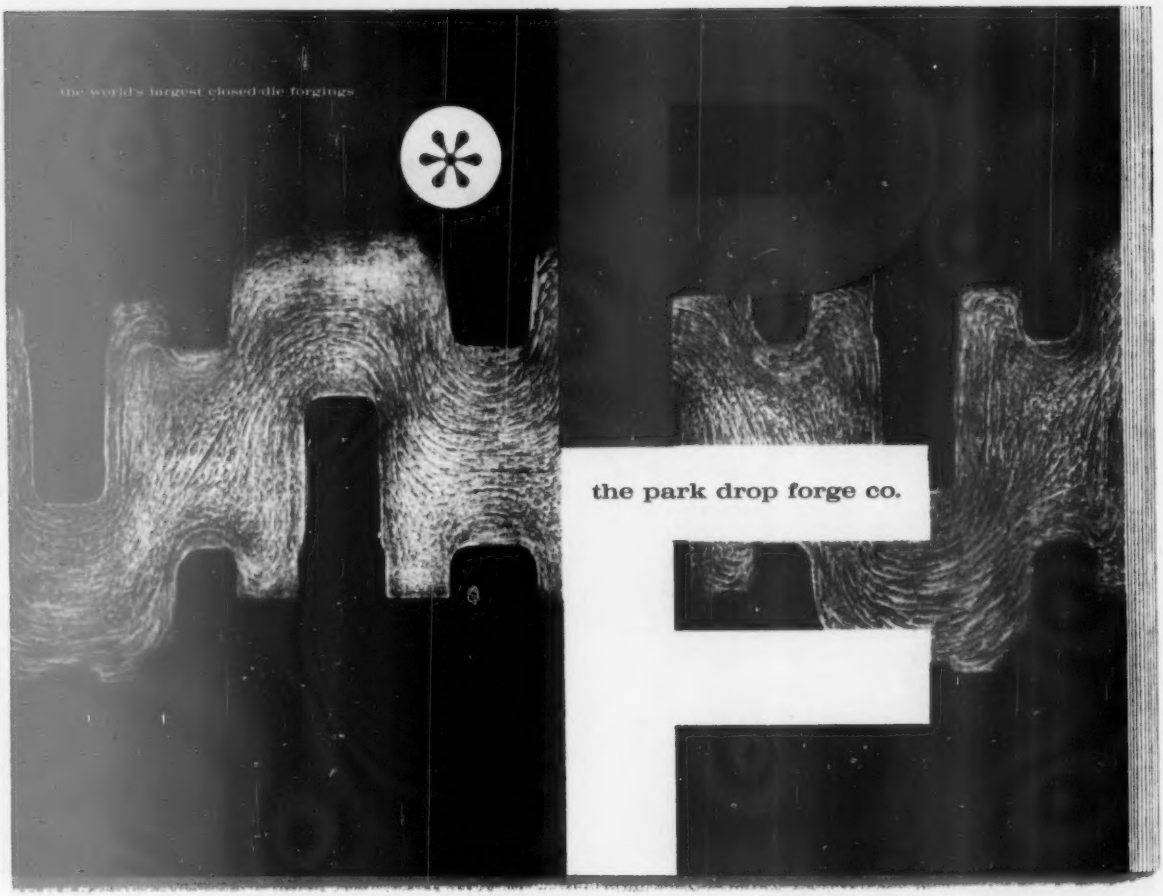




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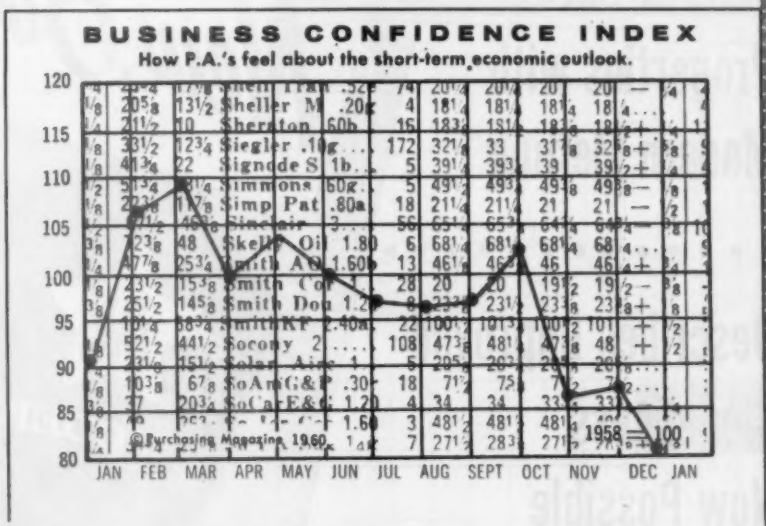
The P. A.'s Outlook

- **Buyers Say Business Slump Will Continue**
- **Confidence Index Hits Three-Year Low**
- **N.A.P.A. Report Is Pessimistic**

PURCHASING Magazine's depressed Business Confidence Index has slipped another seven points.

The index, an indicator of how P. A.'s feel about the short term business outlook, dropped to 80 (1958=100) in December. This is the lowest level in almost three years.

In replying to PURCHASING Magazine's Business Confidence Survey, the purchasing agent for a Minneapolis foundry expressed the feelings of many P. A.'s: "There is now no chance for an upturn. Business in general shows no signs of any advancement."



Purchasing Magazine's Business Confidence Index dropped seven points this month. This indicator of purchasing agent opinion—based on a survey of 1000 P.A.'s from coast to coast—now stands at 80 (1958=100). Buyers apparently do not foresee any marked pickup in business during December, January or February.

See Long-Range Signs

However, some P. A.'s note that there are long-range signs of better business ahead. For instance, the P. A. for a Kansas City, Mo. company says "Our leveling off should be over soon. The end of 1961 will pick up slightly."

The recent election results will also bring changes in the business picture, a few buyers say. One P. A. for a Kentucky firm observes that "We can expect inflation under the new Administration, but not too much in 1961."

According to the National Association of Purchasing Agents, the "general business situation (is) charged with somewhat more pessimism than optimism."

The N.A.P.A. says "Pressures exerted by manufacturers to hold minimal production levels brought about a rather noticeable lowering of prices . . . Coupled with this softening of prices is the continued desire of purchasing executives to reduce their inventories, resulting in a lesser overall demand."

The business survey report of the Chicago association indicates cautious and conservative buying trends. It notes "lower inventories, employment levels, and backlogs."

The report says "For the fourth consecutive month, an increasing number of companies report paying lower prices. A renewed resistance to higher prices seems to be indicated by the reduced number in the higher category."

Says the Cleveland association: "No noticeable change, either better or worse, will be seen until after the first of the year."

It adds that "There is every indication that consumers and industry are holding back and are not willing to commit themselves beyond their immediate needs. The current level of business apparently will be with us for some months to come."

The Pittsburgh association notes that "Fierce competition for what business is available has serious effects on profit." It says also that business conditions "have taken quite a tumble."

Lower Backlogs Reported

Forty-seven percent of those surveyed report that their companies have lower backlogs. Almost 40% say backlogs are the same, while 14% note larger backlogs.

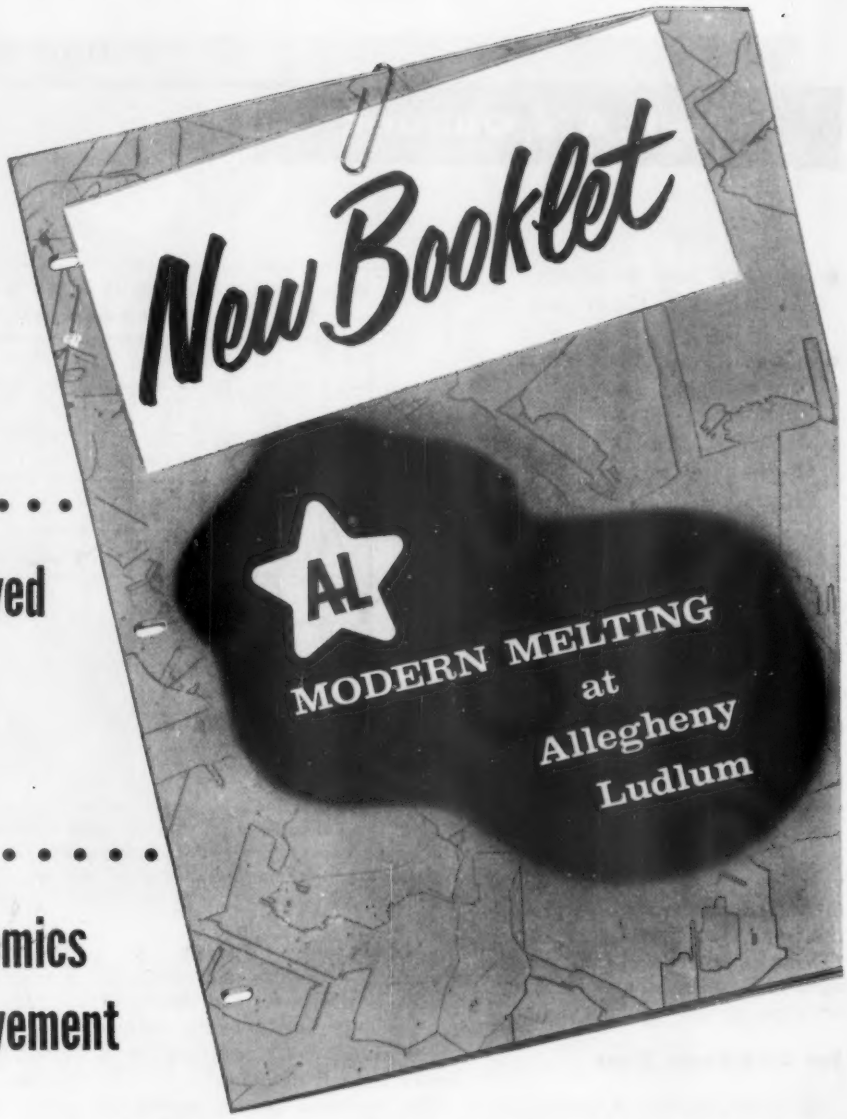
The Canadian group says that "Manufacturing and processing industries are, in general, experiencing difficulty in meeting the rosy forecasts of a year ago."

It adds that benzol is in short supply among purchasing agents in Canada. Among the items that Canadian association members are paying lower prices for are copper and its products, zinc, and tin. Higher prices are reported for raw jute and its products.

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If your job involves getting the most out of metals, you will find much useful information in this 20-page booklet, Modern Melting at Allegheny Ludlum. It's packed full of charts and graphs. For your copy ask your A-L representative, or write: ***Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pennsylvania. Address Dept. P-12.***

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Price Trends

- **Demand for Nonferrous Metals Continues Slow**
- **Copper Stocks Increase, While Shipments Decline**

THERE'S still no pickup in the nonferrous metal markets. Metalworking companies are ordering just about enough metal to meet current production requirements.

Here's the picture in some of the more important commodities:

Copper: Most copper buyers are relatively confident of the availability of the red metal in the coming months. Therefore, they're planning their purchases accordingly.

This confidence is backed up by the release of October statistics by the Copper Institute. U. S. producer stocks shot up to the highest level in two years, while shipments delivered to fabricators dropped sharply.

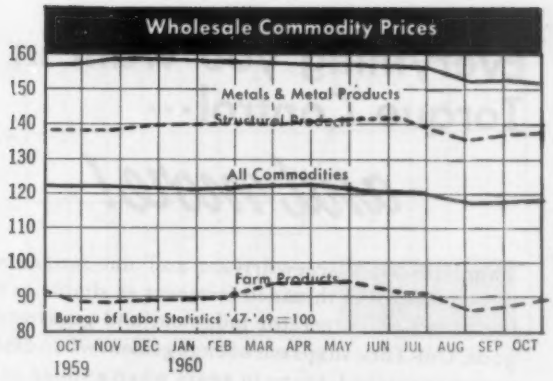
Tin: There seems to be a slightly firmer undertone in the tin market. Nevertheless, buyers still have the upper hand when negotiating with tin suppliers.

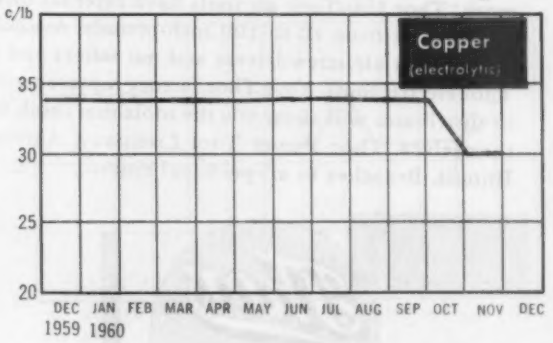
Some tin stocks at Malayan mines are now available for disposal but the amount is not large enough to affect current price levels.

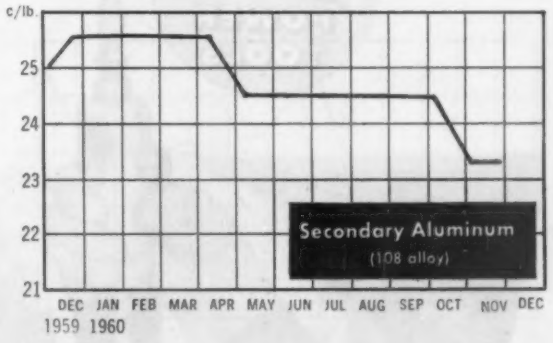
Rubber: Demand for rubber continues to be weak. In Singapore, prices have been firmer in recent weeks, while London prices are relatively unchanged.

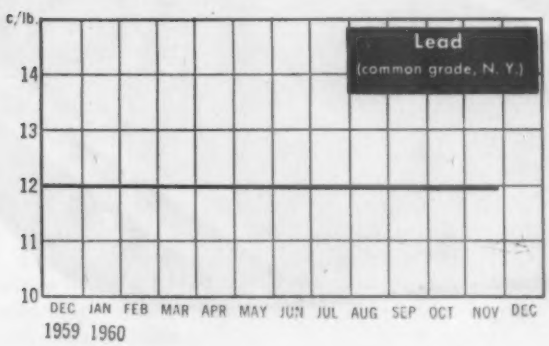
Zinc: The zinc market has been quiet recently. The small amount of buying that is being done is centered largely in Special High and Prime Western grades.

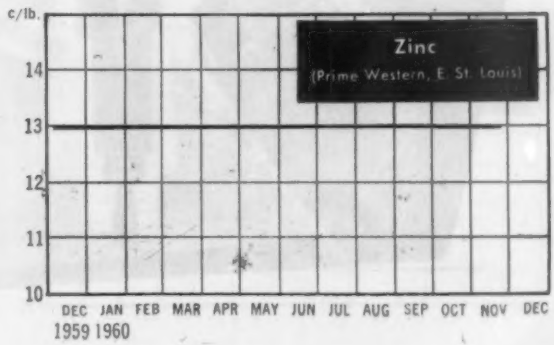
Shipments of zinc droppd 2999 tons in October











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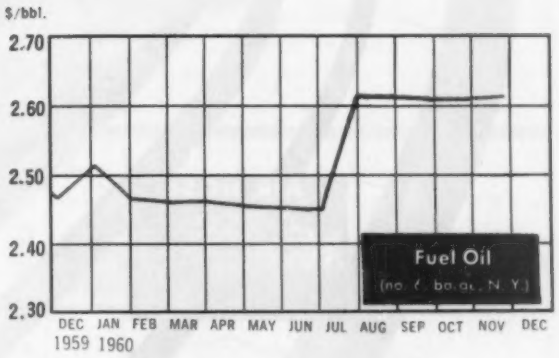
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Price Trends





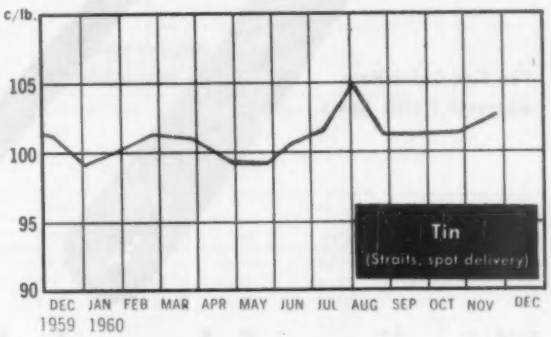
to 65,183 tons, reports the American Zinc Institute. During the same period, production increased slightly over 3000 tons to 63,005 tons.

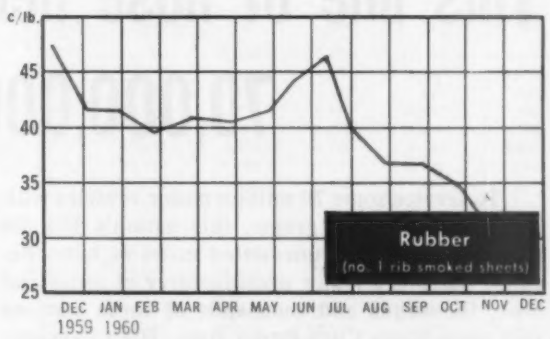
There's a possibility that the price of zinc may drop next year from the 13-cents-a-pound level it has held since early this year. A drop in price was probably staved off early in 1960 because of the lower output caused by strikes at properties of Bunker Hill Company and New Jersey Zinc Company.

Lead: Some end-of-the-month buying last week caused a slight flurry of lead purchases. But there has been no major increase in sales recently.

Many purchasing agents will follow a hand-to-mouth buying policy for lead this month. The current 12-cents-a-pound price level will probably hold in 1961. At least that's the opinion of Simon D. Strauss, vice president of American Smelting & Refining Company.

It looks like government intervention in the lead and zinc markets will continue to be limited to the quota system—at least until the Administration of President-elect Kennedy officially takes control. In the past, President Eisenhower has been quite reluctant to go along with the idea of either tariffs or subsidy payments.

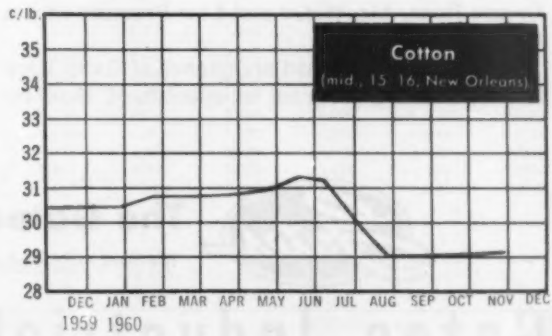


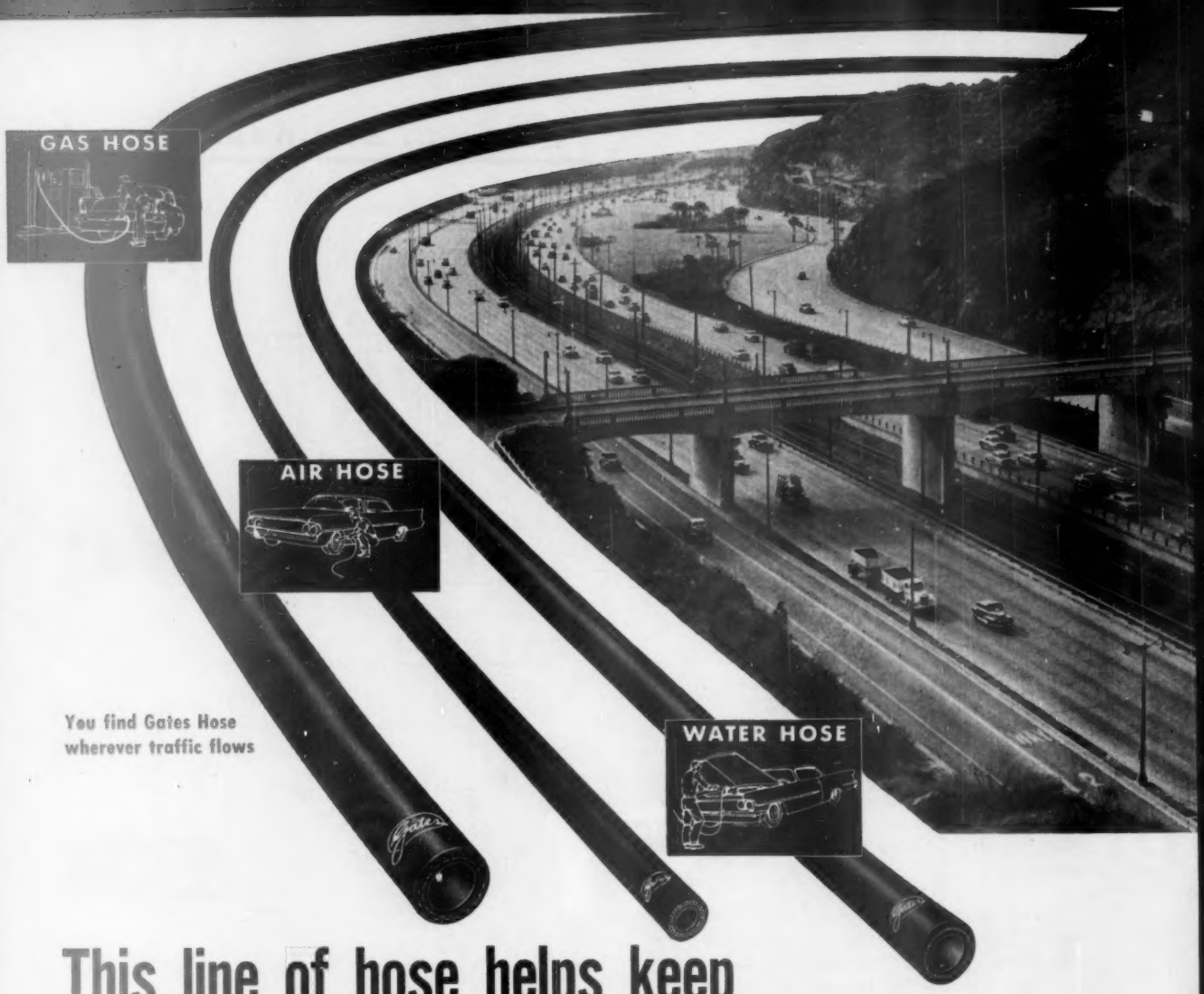


Wholesale Prices: The October Wholesale Price Index rose 0.5% to 119.7 (1947-49=100), according to the Department of Labor. This largely reflects temporary price hikes for farm supplies and food products.

A rise in motor vehicle prices outweighed general declines for a majority of the industrial commodity groups. Weak demand was noted in these industries: metals, lumber, rubber, and textiles.

Iron and steel scrap prices dropped 10%. Declines were also reported for nonferrous scrap, secondary electrolytic copper, aluminum ingots, and copper tubing.





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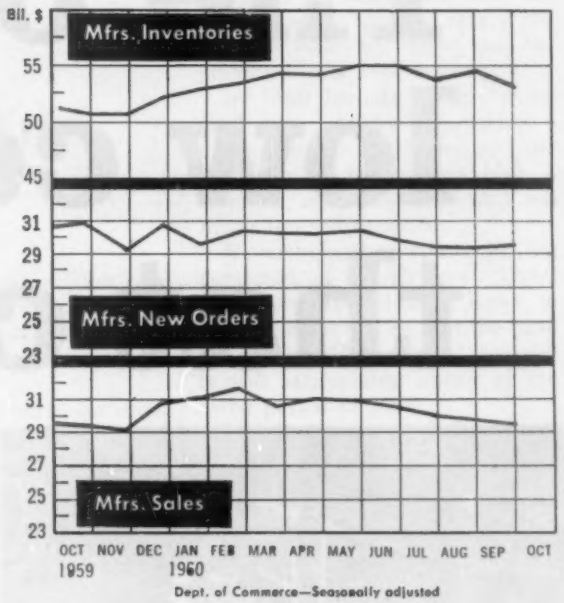
• Sales, Inventories Fall While New Orders Rise

MANUFACTURERS' sales and inventories declined in September and new orders rose, reports the Commerce Department.

Sales dropped 1% to $31 billion, continuing the gradual downtrend since February. Both durable and nondurable shipments were lower.

Inventories fell $200 million to $54.8 billion. Almost two-thirds of the liquidation was in the durable goods sector. Among nondurables, tobacco manufacturers appeared to be increasing stocks.

New business advanced $300 million to $30.3 billion, for the second consecutive monthly rise. This hike was largely attributable to increased defense spending, and centered in electronics, communications, and aircraft companies.



Dept. of Commerce—Seasonally adjusted

	1959	1960				
	Sept.	May	June	July	Aug. (r)	Sept. (p)
Manufacturers' Sales Seasonally Adjusted (Millions of Dollars)						
All Manufacturing Industries	29,818	30,987	30,780	30,440	30,150	29,940
Durable-goods industries	14,113	15,063	14,880	14,730	14,420	14,350
Primary metal	1,212	2,244	2,010	2,110	1,980	1,920
Fabricated metal	1,759	1,753	1,760	1,730	1,700	1,630
Machinery	4,663	4,775	4,740	4,770	4,700	4,710
Transportation equipment	3,641	3,487	3,600	3,410	3,350	3,460
Lumber and furniture	977	937	910	870	870	820
Stone, clay, and glass	718	749	760	750	730	720
Non-durable goods industries	15,705	15,924	15,890	15,720	15,720	15,590
Food and beverages	4,618	4,627	4,630	4,630	4,660	4,670
Tobacco	408	398	400	380	410	390
Textile	1,222	1,286	1,270	1,230	1,200	1,160
Paper	1,029	1,044	1,050	1,080	1,090	1,090
Chemical	2,273	2,352	2,350	2,300	2,330	2,280
Petroleum and coal	3,301	3,180	3,180	3,190	3,170	3,180
Rubber	544	550	520	480	480	510
Manufacturers' Inventories Seasonally Adjusted (Millions of Dollars)						
All manufacturing industries	51,892	54,951	55,100	54,900	54,980	54,790
Durable goods industries	29,817	32,071	32,230	32,050	32,080	31,950
Primary metal	3,923	4,696	4,800	4,750	4,710	4,650
Fabricated metal	3,117	3,354	3,340	3,330	3,340	3,290
Machinery	9,741	10,599	10,640	10,580	10,590	10,500
Transportation equipment	7,305	7,522	7,460	7,340	7,360	7,360
Lumber and furniture	1,860	1,848	1,890	1,900	1,920	1,960
Stone, clay, and glass	1,277	1,434	1,440	1,440	1,440	1,450
Non-durable goods industries	22,075	22,880	22,870	22,850	22,900	22,840
Food and beverage	4,832	4,999	4,990	4,940	4,950	4,950
Tobacco	1,930	1,955	1,950	1,940	1,940	2,010
Textile	2,516	2,708	2,700	2,690	2,670	2,640
Paper	1,471	1,584	1,590	1,610	1,630	1,640
Chemical	3,970	4,08▷	4,110	4,140	4,180	4,160
Petroleum and coal	3,267	3,336	3,300	3,290	3,290	3,250
Rubber	1,114	1,184	1,200	1,230	1,240	1,210
Manufacturers' New Orders Seasonally Adjusted (Millions of Dollars)						
All manufacturing industries	30,552	30,470	30,110	29,190	30,010	30,360
Durable-goods industries	14,747	14,680	14,340	13,840	14,410	14,680
Non-durable goods industries	15,707	15,790	15,770	15,350	15,610	15,680

(r) Revised. (p) Preliminary.

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Low Inventory Levels Seen Through June 1961

GOVERNMENT forecasters see no sudden reversal in the current trend in industry of working down inventory levels. The prevailing view is that industrial buyers will take a cautious approach during the first two quarters of '61, after which new factors will begin to shape up.

For the present, the primary softness in the economy is in the inventory sector. During the third quarter, inventory book values in trade and manufacturing were reduced about $200 million. According to the Department of Commerce, a substantial part of the decline reflected lower replacement costs.

What has happened in the economy? Basically, there has been a loss of momentum. In 1959, the gross national product was $482 billion; the forecast at the beginning of this year was for a GNP of $510 billion.

The prospects then were painted of a glowing entrance into the "fabulous 60s". However, the total for this year will fall short of the $510 billion figure. The total is likely to be about $500 billion—a 2.8% increase over 1959.

This increase is significant because 2.8% is identical with the average annual growth rate of the nation's economy since the beginning of the 20th century.

By 1960 turning in an "average" year, it now represents a disappointing condition in the economy. It means too high a level of unemployment and too much unused capacity.

Nevertheless, consumer buying continues at a high level. There has been some slowing down in the last eight weeks, but the total for the first 11 months of the year is still appreciably ahead of the same period of 1959.

The Department of Commerce reports that total manufacturing payrolls dropped about 2% since midyear. The drop has been concentrated in primary metals, machinery, and transportation equipment.

For the first 10 months of this year, personal income was at an annual rate of $403½ billion—$22 billion higher than in the same period of last year. This 5½% rise represents mostly a gain in real purchasing power.

While there has been a drop in industrial payrolls in the last several months, personal income has been held up by unemployment compensation and other government "transfer payments".

For the first half of next year, government experts indicate that the drop in payrolls will outpace the increase in "transfer payments." During some time in the first or second quarter of the year, personal income is expected to drop between 1% and 2%.

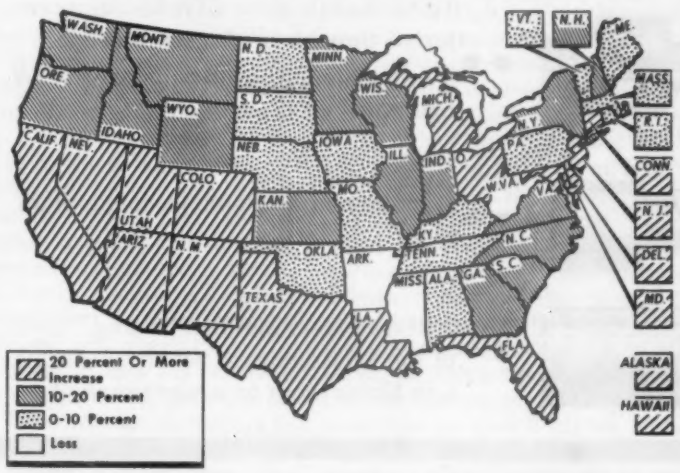
Louis J. Paradiso, chief statistician of the Office of Business Economics at the Department of Commerce, anticipates that the drop in personal income in the period ahead will be more severe than it was during the recession of 1958. But he feels that this trend in itself is not alarming.

He says that two factors will be apparent in the first half:

(1) GNP will be in a moderately declining phase.

(2) There will be a decline in

Census Shows Population Shifts



Final 1960 census figures released by the Commerce Department indicate many changes in the United States population, as shown on the map above. While most of the states increased in population, three states—Arkansas, Mississippi, and West Virginia—lost population since 1950. The shift in population will cause a realignment in the House of Representatives, beginning with the session in January 1963. Among the big changes will be a loss of two seats by New York to 41 and a gain of eight seats by California to 38.

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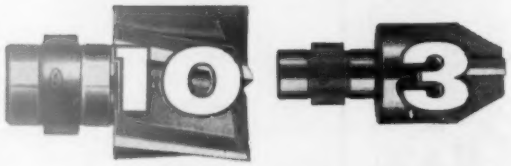


Designed especially for the stronger, safer 1960 Series socket head cap screws, the Continental No. 1B Standard Toolroom Set provides a wide range of sizes in a cost-saving, space-saving tool set.

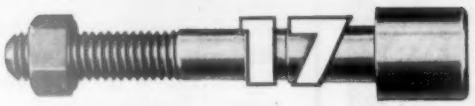
Supplied in a sturdy, fitted oak box, and equipped with a complete lineup of tools in the most-used sizes, the No. 1B gives you traditional CTW quality and performance for toolroom or job shop counterboring, spot-facing and countersinking operations.

Call your local Ex-Cell-O Representative, or contact Continental Tool Works for details on the full line of CTW Counterbore Sets, and standard and special cutting tools and broaches.

STANDARD TOOLROOM SET NO. 1B CONTAINS:



- 10 hand-detachable CTW Counterbores for #6 through ⅝" dia. screw heads.
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- 17 hardened and ground counterbore pilots.



- 2 CTW Holders with non binding, "twist of the wrist" release action. (Available with Morse taper or straight shank.)

"No one has ever reported failure of a Continental Counterbore Drive!"

60-60

Continental CTW TOOL WORKS DIVISION OF EX-CELL-O CORPORATION DETROIT 32, MICHIGAN

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capital spending.

In general, Paradiso s[illegible]sumer durable goods sales [illegible]ely to continue downward until the economy takes on a firmer tone.

Government analysts take the view that the current adjustment in inventory is not a temporary hesitation in buying while industry is learning to live without inflation. This idea has been advanced by some economists.

The thinking of the government experts is this: industry has discovered how to operate on less inventories and is likely to continue to hold them down. Thus the trend is simply a long-term adjustment.

More Inventory Cuts

Guided by this assumption, government forecasts are based on a continued period of inventory liquidation. The level of inventories at the end of September was $4 billion higher than in the same month a year ago. Some government economists take the view that there is considerable margin for further reductions.

Whether this thinking represents a profound economic judgment is not the primary consideration. It does coincide with the thinking and estimates of a large segment of industry planners. If enough businessmen start to think along these lines, then inventories will be cut even more.

While there is no firm forecast on capital spending during 1961, the opinion most generally voiced here is that expenditures for plant and equipment in 1961 will be 10% below this year.

One view on how the economy will shape up holds that it's all up to the consumer. According to this belief, the government has little power to influence the course of the economy.

Woodlief Thomas, economic advisor to the Board of Governors of the Federal Reserve System, sees the resumption of economic expansion in the near future and the maintenance of growth in the years ahead as depending "more largely upon the whims of consumers and the actions of producers and distributors in adapting their products, prices, and selling practices to those whims, than upon government policies".

Federal construction analysts take a much more bullish view. Reporting on the construction industry outlook, the Business and Defense Services Administration of the Department of Commerce predicts a record volume for 1961.

Construction volume this year dipped below the previous peak year of 1959. But the industry is expected to increase the dollar value of work put in place during 1960 by 4% over the current rate.

While this would be a higher dollar value than 1959, it is 2% less in terms of physical volume. The difference is due to increasing costs in the industry.

The Commerce Department forecast for 1961 construction is based on the assumption that the nation's total output of goods and services will remain at about the same levels as in 1960. Higher spending by federal, state and local governments—including an increase in highway construction—could increase the dollar volume of construction even further.

While the volume of construction will be mildly stimulating to the economy, the increasing level will not be a factor until midyear. It is then that the construction season gets into full swing.

The construction industry, while looking forward to improved conditions, does not think that the added sales are sufficient to lessen the intense competition in all levels. Manufacturers of construction equipment report that they have had to absorb higher costs of materials and a higher wage structure. They say that they need higher prices to maintain a reasonable profit margin.

Despite the justification for higher prices, equipment producers indi-

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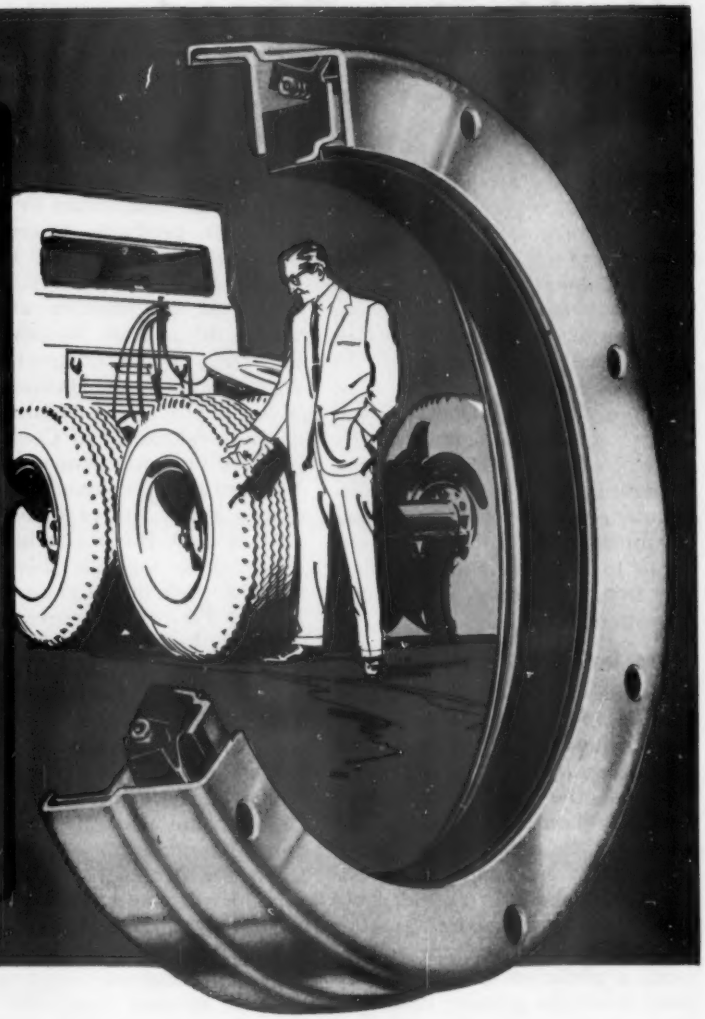


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"I want a 100,000 mile wheel seal," said truckmaker



"Here's Scotseal," said C/R

Premature wheel oil seal failure—often within the warranty period—was plaguing a major truck manufacturer. This was costly. One seal replacement took three hours labor and three hours tractor downtime—important money to the maker, dealer and buyer. Then C/R found an answer to the problem. A unique, new design called the C/R Scotseal* was submitted and tested . . . then tested again and again. First result: C/R Scotseals repeatedly ran 100,000 miles and more with no sign of failure. Second result: they're approved now for every truck tractor this manufacturer makes.

Just why does this seal go 100,000 miles? C/R developed a special, ideal sealing surface and made it integral with the seal. The lip runs on this surface, *not on the shaft or bore*. In operation, centrifugal force creates positive, constant contact for leak-free performance. Also, the seal lip is completely encased and pre-lubricated, protecting it against damage in handling and assembly. This remarkable seal merits your consideration wherever high production runs are involved; where oil retention is difficult; and where equipment downtime and replacement costs are critical. The savings it can afford you and your customers may far outweigh the additional cost of this top-quality seal.

Write for your copy of C/R Scotseal Bulletin SS-100.*

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Sirvis-Conpor mechanical leather cups, packings, boots • C/R Non-metallic Gears.

C/R

*Reg. U. S. Pat. Off.

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cate that they will follow a similar course. There is a general effort to hold the line on prices because of the degree of competition prevailing in the industry.

The overall price outlook in construction is for prices to hold at the same level as in '60, possibly with a tendency to edge up.

• Single Manager System Cuts Defense Inventories

The military services have under way a major program to reduce inventories. Under the Defense Department's Single Manager System, one of the military services does all of the procurement of certain specific classes of supplies.

Accomplishments under the system, as reported by the Office of the Assistant Secretary of Defense for Supply and Logistics, include the following:

The Clothing Single Manager has reduced the number of different items by 17%; the Medical Single Manager has eliminated 21% of the supplies; the Subsistence Single Manager has cut 12% of the different food items; and the Petroleum Single Manager has deleted 30% of the oils and greases previously used.

The new Single Manager for industrial supplies reviewed 3500 different kinds of paints, brushes, sealers, and adhesives and tagged 850 for elimination before he started operation. The new Single Manager for general supplies did the same for 1060 different items of office furniture; as a result 668 items will be eliminated.

More than 400,000 different items of hardware and 30,000 different kinds, of hand tools will be reviewed by these new Single Managers. Two more Single Managers are just starting in business to manage 400,000 items of construction and automotive material.

Balancing the inventory takes a two-pronged approach with the military services. They are standardizing to reduce the variety of items stocked and substituting to reduce the quantity. — **A. N. Wecksler**

COTTON* produces big benefits in heavy-equipment plant

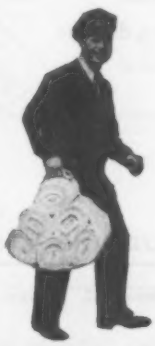


*Cotton toweling supplied to Byron Jackson Division of Borg Warner Corporation by California Overall Cleaning Company, Los Angeles.

• One of the world's largest manufacturers of pumps and oil field drilling equipment, the Byron Jackson Division of the Borg Warner Corporation, Vernon, California, employs a thousand people in a plant covering 400,000 square feet of floor space.

Recently, this progressive company installed Fairfax continuous cotton toweling in its washrooms. Savings were immediately apparent—with cotton toweling, the cost of trash removal was reduced substantially. In addition, management was particularly pleased with the improved housekeeping quality index and the corresponding reduction in fire hazard.

Why not look into the advantages of cotton toweling for your operation? For free booklet, write Fairfax, Dept. S-12, 111 West 40th St., New York 18.



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Detrex Engineers Have Been Coming Up With "Cost Saving" Answers for 30 Years

Every metal cleaning operation has its own particular problems—but they're seldom new to the Detrex engineer. With 30 years of experience, he can produce the right formula to insure maximum productivity and economy in your operation.

He will analyze your product, the type of soil to be removed, the proper equipment and cleaning agent needed, the space and manpower required—every factor that bears on the problem.

When he gives you his recommendation, you can depend upon it to make sense—and save dollars. And when you put his recommendation into practice, you can depend upon Detrex to follow through with the finest service in the business.

Depend on DETREX for Every Metal Cleaning and Processing Need

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Purchasing Follow-up

Value Analysis Saves $45 Million for Navy

An intensive economy drive guided by "value engineering" has saved the Navy's Bureau of Ships $45 million in one year.

According to Rear Admiral Ralph Kirk James, chief of the Bureau, rising costs forced the reduction program. Most of the savings resulted from elimination of changes proposed in ships under construction — without lowering the quality of materials used.

The Navy's value engineers—who are also known in industry as value analysts—include a team of "young men expert in the field of ship design and finance," Admiral James said. They studied the Navy's procurement methods for seven months and then recommended (among other improvements) a sweeping reduction in specifications presented by suppliers to the Navy. An example: previously a turbine and gear set required 3000 plans. Today only nine plans are needed for the same set.

Citing the problem of rising costs, Admiral James pointed out that a World War II submarine cost $4.5 million while 1960's nuclear powered subs cost $57 million each. Earlier destroyers cost $9 million each and today's guided missile destroyers cost $35 million each.

Capital Spending by Rails to Drop 10% in '61

Capital expenditures by the nation's railroads will decline more than 10% in 1961 from this year.

That's the prediction of purchasing executives for three leading railroads and Holcombe Parkes, president of the Railway Progress Institute. If the forecast is accurate, it means that spending for equipment, roadway, and structures would drop to $850 million from the $952 million that is expected to be spent in 1960.

The purchasing agents who made this prediction were Henry F. McCarthy, vice president of purchases and stores of New York Central Railroad; Frank J. Steinberger, vice president and general purchasing agent of Atchison, Topeka, & Santa Fe Railway; and H. B. Nordstrom, director of purchases of Great Northern Railway.

Along with the forecast of a drop in capital expenditures the purchasing executives indicated that they anticipate only a gradual improvement in business next year. Steinberger estimated that the railroads will order about 40,000 new freight cars in 1961. This compares with an estimated 50,000 to 55,000 new cars in 1960 and 56,489 new cars in 1959.

The purchasing spokesmen said they are trying to avoid buying foreign equipment and supplies. However, they warned that American equipment makers must reduce their prices if they hope to keep receiving orders.

McCarthy noted that his railroad had bought foreign goods in the past. He added that it would do so again if foreign suppliers continue to offer lower prices.

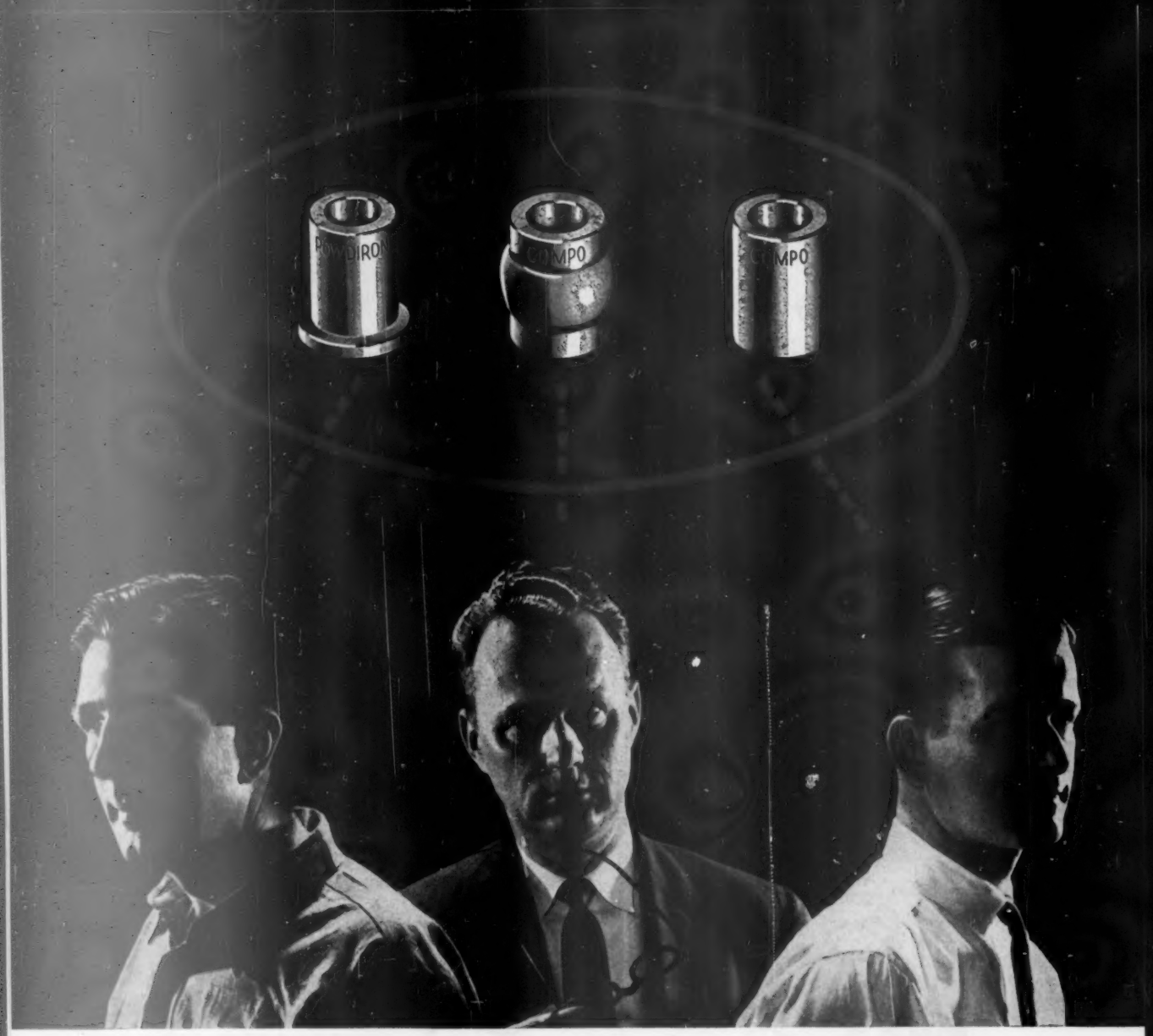


"Sure I remember telling you we didn't want your business but at the time we didn't think we could get it."

Survey Shows Execs Less Optimistic Than in '59

Businessmen are not as optimistic about the first quarter of 1961 as they were about the same period of 1960, according to a survey by Dun & Bradstreet.

Forty-nine percent of those surveyed expect first quarter '61 sales to be higher than in the first quarter '60. But a year ago at this time,



Specialization in bearings enables us to apply to your bearing problems an unmatched engineering talent and experience in powder metallurgy. You benefit, too, from outstanding manufacturing facilities, including the world's largest inventory of dies. Whatever your need, when it's bearings, see the bearing specialists... see Bound Brook.

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Pioneer in Powder Metallurgy Bearings and Parts.
Plants at Bound Brook, N.J. and Sturgis, Mich.

65% expected first quarter '60 sales to be higher than the similar period of the previous year.

However, businessmen are expressing more optimism today than they did at the end of 1958. A greater percentage of those polled foresee higher sales, profits, and new orders now than they did two years ago.

Regarding profits, 51% of the group surveyed anticipate no change from the first quarter of 1960. Thirty-five percent expect an increase in profits, while 14% expect a decrease.

Four-fifths of the businessmen say that they expect no change in the prices of the items they sell. Fifteen percent expect an increase in prices and 5% expect a price cut.

New Orders Steady

Concerning new orders, half of those surveyed look for no appreciable change. More than 40% expect an increase in new business and the remainder believe there will be a decrease.

Eighty-five percent of the executives say that they expect no change in their workforce. However, 10% plan to increase the number on their payrolls, while the remainder believe that they will cut back on employment.

The businessmen were also surveyed by D&B about the level of their inventories at the end of the quarter. Sixty-seven percent said that there would be no change, 19% said that there would be an increase, and 14% said that there would be a reduction in inventories.

Seek Staff Study for New York City Purchasing

A study of the size and qualifications of the staff needed for New York City's department of purchase has been requested by Commissioner Roger J. Browne.

Browne has headed the central purchasing agency, which spends $75 million a year on supplies and materials, for about six months. He asked that a study be made by City Administrator Lyle C. Fitch so that the department could operate at top efficiency and economy.

The commissioner said recently that neither he nor the city's investigation department had found any evidence of corruption by purchasing department employees in connection with the purchase of rock salt.

Committed No Wrong

Alleged irregularities in rock salt buying were disclosed during the term of the former purchase commissioner, Joseph V. Spagna. Spagna was suspended by Mayor Robert Wagner in June and retired in August.

According to Browne, Spagna was the "victim" of a series of unfortunate circumstances." He says that Spagna did nothing wrong, but had suffered because the purchase department, the Controller's office, and the sanitation department did not deal cooperatively with the rock salt situation.

"We are all cooperating now," says Browne. "I believe that we now have a foolproof system designed to see that city departments get the desired quantity and quality of materials."

New York City spends around $750,000 annually for rock salt, used in snow removal work.

P.A.'s Learn About Steel At Vendor 'Round-Up'

Some 180 purchasing agents and other customers of Viking Steel Company, Cleveland were invited to an open house "round-up" recently at the company plant.

The occasion was a presentation by Armco Steel Corporation (Viking is an Armco distributor) of the features of its 17-4PH Stainless Steel. The entire event was done in a Western motif.

Stuart Cole, senior product

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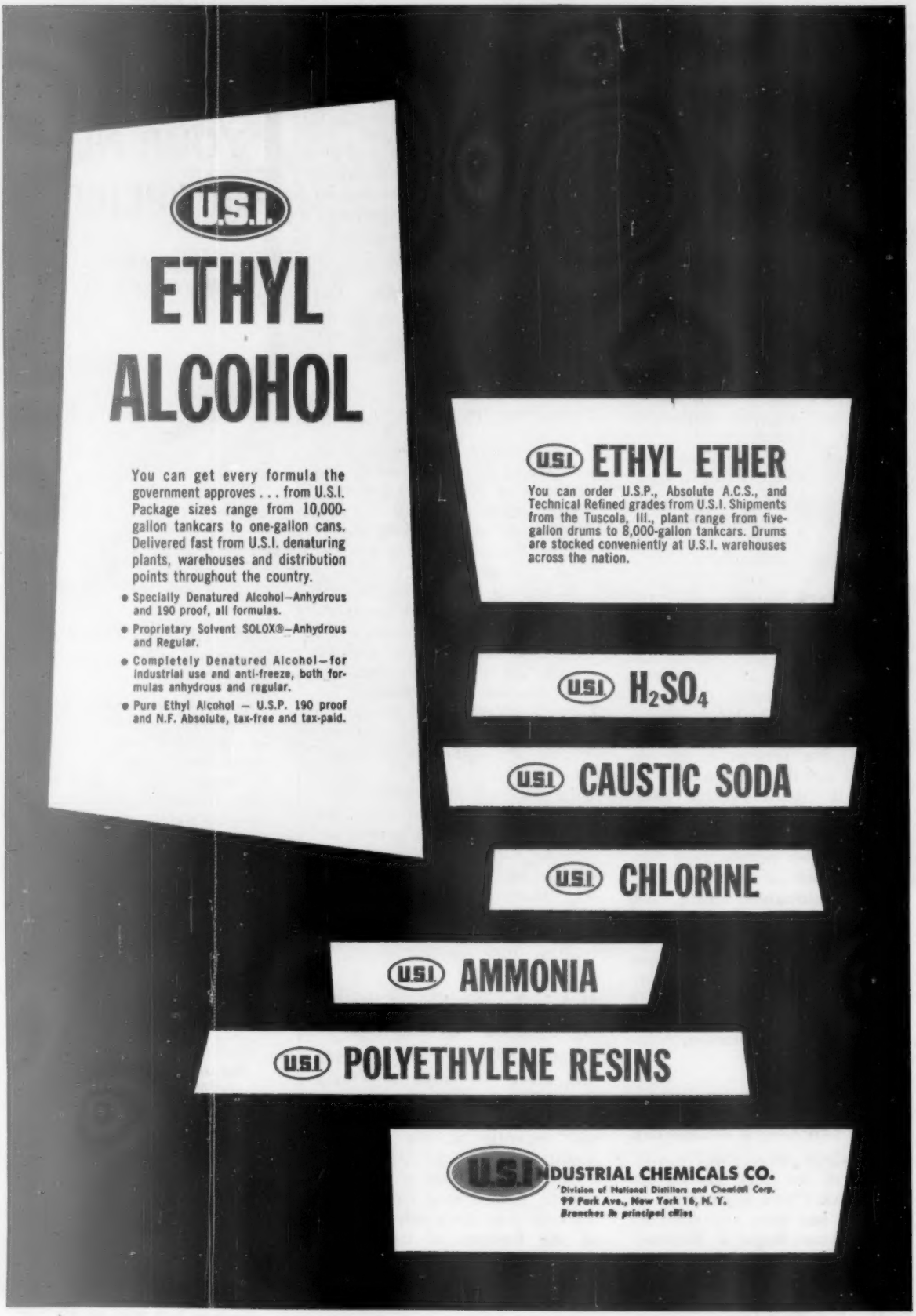
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specialist for Armco, told the group that "17-4PH, the newest and fastest growing alloy in the stainless steel field, is winning wide acceptance in commercial and industrial applications." Among the applications for the material that he mentioned are valve stems, pump shafts, fasteners, hydraulic couplings, feed machinery parts, surgical instruments, oil field equipment, and dam roller guides.

Cole said that the material has these three advantages:

(1) *High Strength*—up to 200,000 pounds per square inch.

(2) *High Hardness and Wear Resistance*—Rockwell hardness of C-44 can be attained by simple heat treatment.

(3) *Good Corrosion Resistance*—equal to Type 304 Stainless in most applications.

A motion picture on the machining of stainless steels was also shown to the gathering. J. J. Moore, vice president of Viking, was in charge of the program.

Machine Tool Supplier Offers Trade-In Plan

A machine tool company is offering a trade-in allowance to purchasing agents for its old machines in an effort to increase sales.

Brown & Sharpe Manufacturing Company, Providence, will allow $500 for each old B&S automatic screw machine traded in for a new B&S automatic screw machine. The new machines sell for between $10,000 to $20,000.

This is the first time that the company has tried the trade-in technique common to the automobile and appliance industries. It is designed to spur replacement sales, since Brown & Sharpe estimates that about half its 75,000 machines of this type now in use are 10 to 20 years old. And some of the machines still in use range up to 50 years old. The old machines that are taken in trade will be sent to the foundry as scrap metal.

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THE MAN FROM MUELLER BRASS CO.

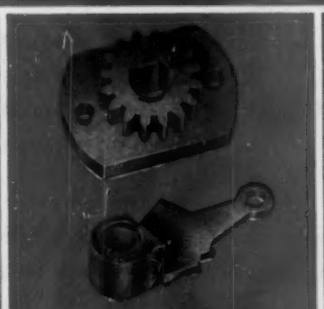
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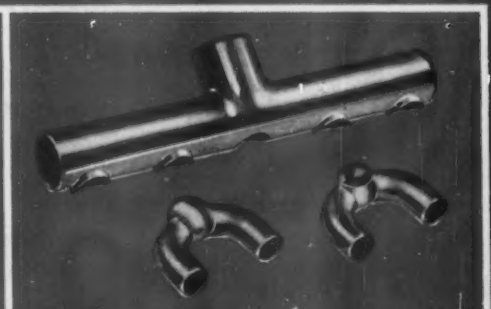
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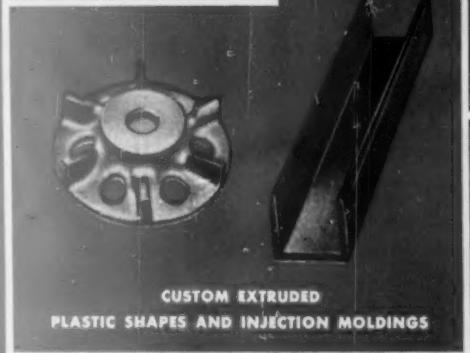
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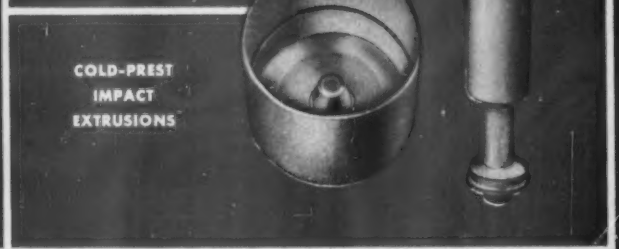
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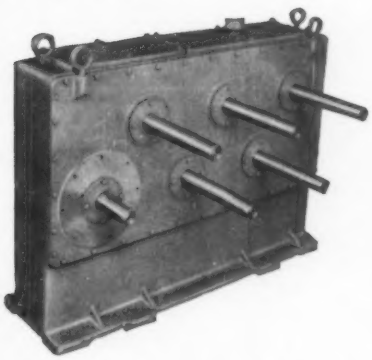
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Radar drives are another example. In this case the gears were hardened and precision ground to provide the high degree of accuracy needed for precise positioning of the radar antennae. The primary requirement was minimum backlash and uniform backlash, combined with maximum rigidity.

To solve your special drive problem and to give your product a years-ahead competitive edge, let us know your requirements. Our engineering staff will be glad to work with you.

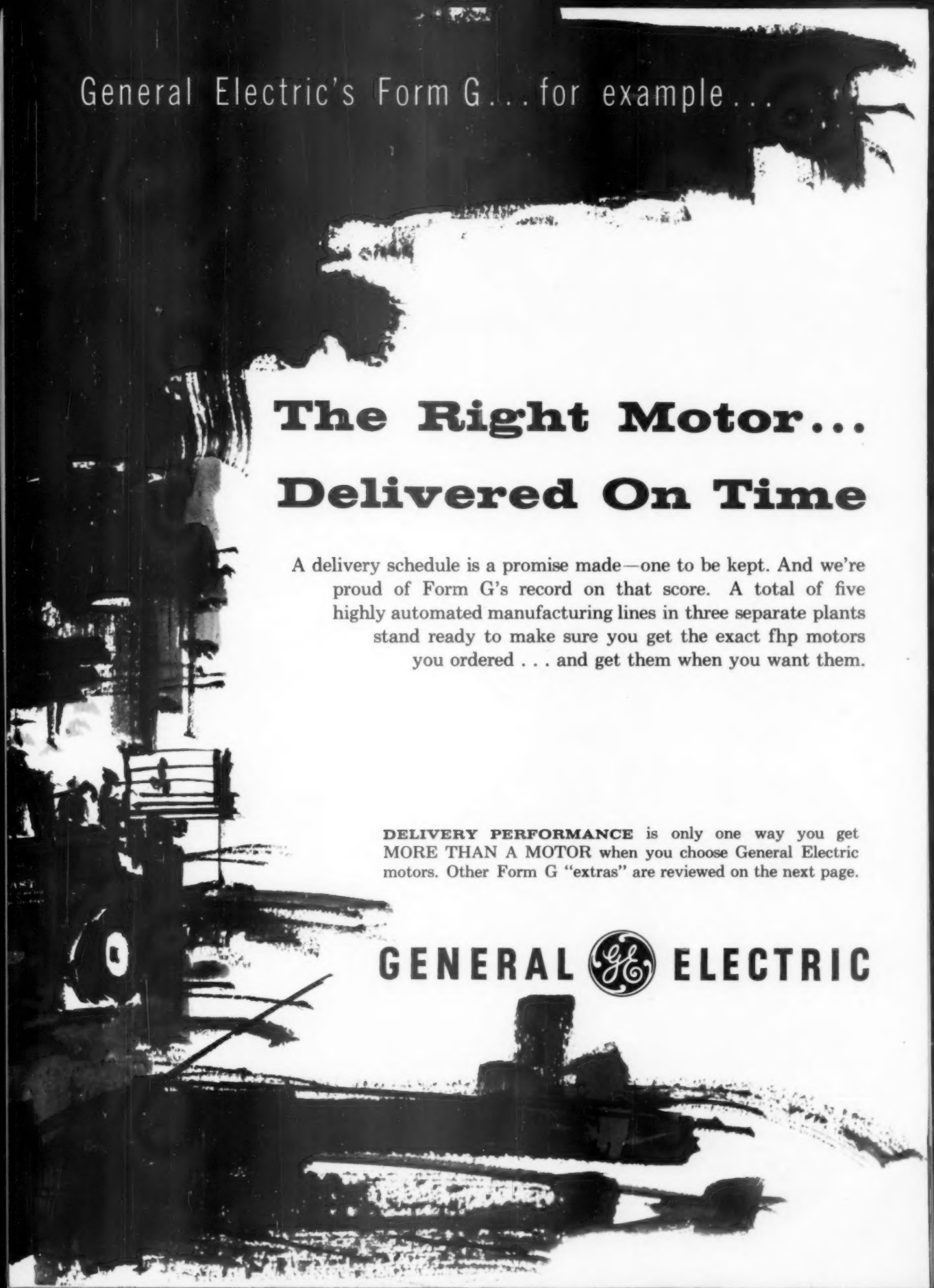
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DELIVERY PERFORMANCE is only one way you get MORE THAN A MOTOR when you choose General Electric motors. Other Form G "extras" are reviewed on the next page.

GENERAL ELECTRIC

These unmatched extras make G.E.'s Form G

MORE THAN A MOTOR



YEARS-AHEAD DESIGN LEADERSHIP—General Electric's year-in year-out leadership in fractional horsepower motor design and innovation helps meet your changing product demands; helps keep you "out front".



FAST, LOCAL SERVICE—A nationwide network of Electric Motor Service Stations, kept up-to-date on latest motor techniques by twenty traveling motor specialists, assures fast, local motor repair or replacement.



DESIGN VERSATILITY—Form G fhp motors offer amazing versatility and design freedom for incorporation into your product. Whatever your product requirements, there's a Form G fhp motor to meet them.



QUALITY CONTROL—"Individualized" quality control assures consistently high quality. *Every* Form G motor is thoroughly tested at all stages of production for top performance and long-life characteristics.



EASE OF ASSEMBLY—Compact G-E Form G fractional horsepower motors can be mounted and hooked up in a matter of seconds; offer assembly-line savings in time and money; cost less to ship or handle.



EXPERT APPLICATION AID—General Electric application engineers, experts on the Form G fhp motor and the various ways of applying it, are always on hand to help you solve your unusual motor applications.

Make sure you get MORE THAN A MOTOR . . . choose General Electric Form G fhp motors, available in NEMA 48 and 56 frames. For more information contact your nearby General Electric Apparatus Sales Office or write General Electric Co., Section 702-109, Schenectady 5, N. Y.

GENERAL ELECTRIC



Sees $4500 annual screw saving



RB&W fastener survey uncovers use of special item which is replaceable by standard hex screw at much less cost

Of course you pay more for a "special" than a "standard" item—and that includes fasteners. So, when surveying a company's usage of fasteners, the RB&W Man looks sharply for the "specials"—and a valid reason for their use.

He could find no good purpose for the extensive use of screws with heavy head and milled body in one particular product. There was neither a specification requiring close fit in very close tolerance holes . . . nor were there exceptionally "sloppy" holes that called for an oversize head to span.

He therefore recommended assembly with standard RB&W High Strength Hex Screws. They would meet any physical requirement for the "special" being used... *but cost 30¢ less per unit.* Yearly total: $4500 more for *profits* instead of *costs.*

Are you *sure* you're not needlessly wasting dollars on fastener specifications? Let the RB&W fastener expert survey them. He's made proper fastener usage a science, is ready to cooperate with your engineers. Contact Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, N. Y.

RB&W

116th year

Plants at: Port Chester, N. Y.; Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. Additional sales offices at: Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. Sales agents at: Cleveland, Milwaukee; New Orleans; Denver, Fargo. Distributors from coast to coast.

For More Facts Write No. 177 on Information Card—Page 32

For More Facts About Ad on Following Page Write in No. 178→

A REPORT FROM ALCOA



To the purchasing agent who must decide about ALUMINUM WIRE

How one p.a. weighed his decision carefully...and cut costs drastically

Yes, he literally *weighed* his decision. Discovered that aluminum wire weighs 30% to 50% less than copper. This coil, for example, weighed 18½ lbs., compared to 26 for the same length of copper wire with the same electrical capacity.

Less weight means faster, easier handling and installation.

Immediate savings. Compare first-price cost with that of equivalent copper wire, and you'll quickly see how favorably Alcoa aluminum wire stacks up. When you consider *other* costs—handling, installing, pulling through conduit—you'll see how aluminum's advantages work for you all along the way.

That's why it pays for a purchasing agent to *know what you need to know about buying wire:*

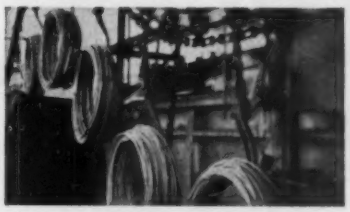
1. Alcoa's aluminum wire can cost considerably less than copper.

2. Availability is no problem. Rome Cable Division of Alcoa maintains adequate factory stocks and a nationwide network of distributors.

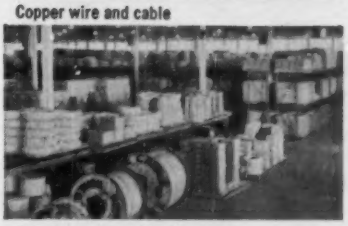
3. You can get technical and engineering assistance by experts to help in converting from copper to aluminum.

When you decide on your next purchase of wire, be sure you have all the facts at your finger-tips. Contact our nearest sales office. Rome Cable Division of Alcoa, Dept. 14-120, Rome, N. Y.

NOW YOU CAN GET ALL 4 FROM ROME



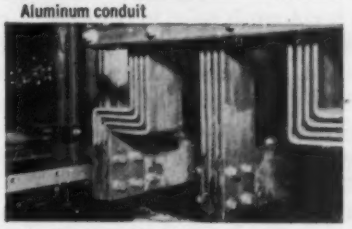
Copper wire and cable



Aluminum wire and cable



Aluminum conduit



Aluminum bus conductor

ROME CABLE
DIVISION OF **ALCOA**



Why worry about fabricating laminated plastics? That's our job.

There is not much point to fabricating laminated plastics in your own shop. And there are good reasons why. One is the material itself.

Synthane laminates are available in sheets, rods, and tubes, and in over 33 standard grades. Choice of form and grade for your part is important. For example, a part which is basically tubular may have to be cut from a sheet rather than a tube. Or the material itself may have to be modified in order to meet your requirements.

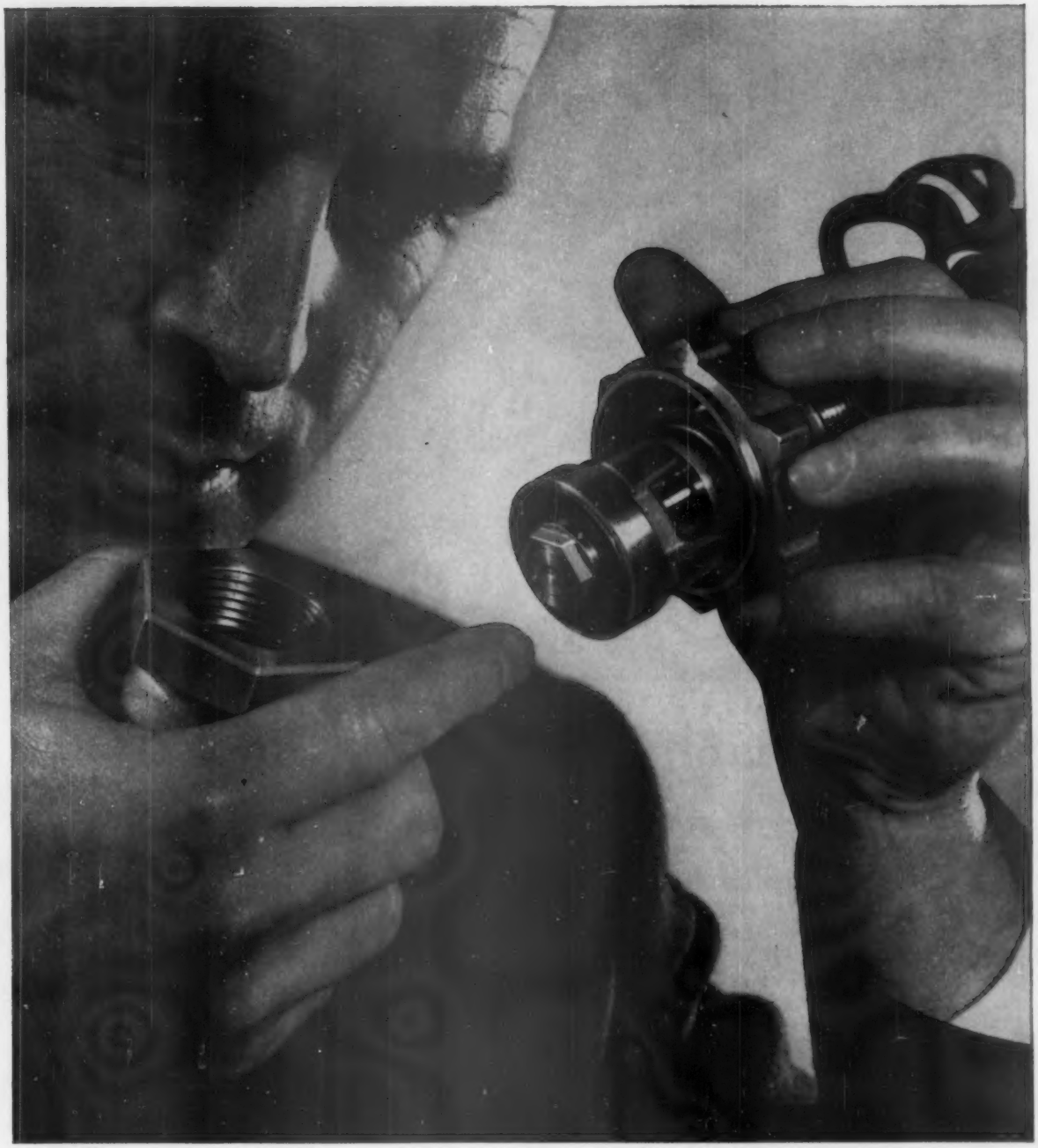
When you do your own machining, responsibility rests finally with you. The possibility of errors in dimensions, machining and tolerances, and of waste and delay suggest that you buy your laminated plastics from us and let us do the fabricating for you. Call any of our representatives—in principal cities—for a quotation or get in touch directly with Synthane Corp., 7 River Road, Oaks, Pa.

SYNTHANE CORPORATION OAKS, PENNA.

Sheets • Rods • Tubes • Fabricated Parts
Molded-laminated • Molded-macerated

You furnish the print . . . we'll furnish the part

For More Facts Write No. 179 on Information Card—Page 32





MEN WHO KNOW VALVES look for the free-swiveling disc holder—know it keeps disc from grinding on seat, chops maintenance costs, assures leak-proof closure. It's an O-B feature—one of many improvements you get by standardizing on the complete O-B bronze valve line. Ask your O-B distributor for the valve in the orange-and-black box.

OHIO BRASS COMPANY • Mansfield, Ohio

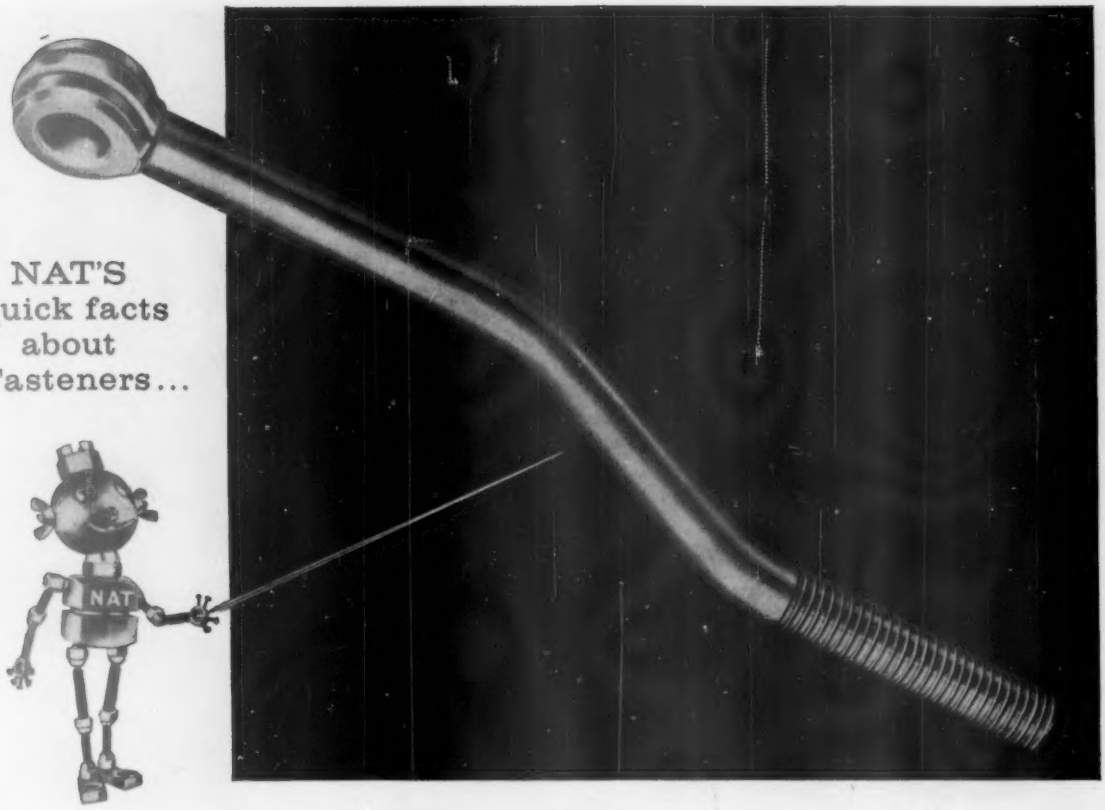
O-B VALVES

HOLAN

10072-V

For More Facts Write No. 180 on Information Card—Page 32

NAT'S
quick facts
about
Fasteners...



Shining example...of big things in **specials** by National

This is a large offset eyebolt, shown here big as life. We designed and made it to order for one of our customers.

To begin with, it shows that we can and do make some sizable things in the way of cold headed Special Products.

But there's more here than seems to meet the eye.

When our customer brought us this eyebolt, he had been having it made as a forged eye welded to a machined bolt, with a cut thread.

We gave it some thought, then made it... with a difference. We cold formed it in one piece, and rolled the thread... turning out a stronger, more practical, and more efficient part, and lopping off costs all along the line.

And there's the real point... what we really mean when we mention doing BIG things in Specials, at National... better parts, large or small, at lower cost, by cold heading and designing for profit.

We do it right along, and we can very likely do it for you, too. Want to find out? Just drop a note to Special Products Service, at our address*. And if you just happen to have a Special problem, tell us all about it—and let us help.

*It will bring you this illustrated booklet "Bring your Special Problems to National", 16 pages about Specials as National sees them.



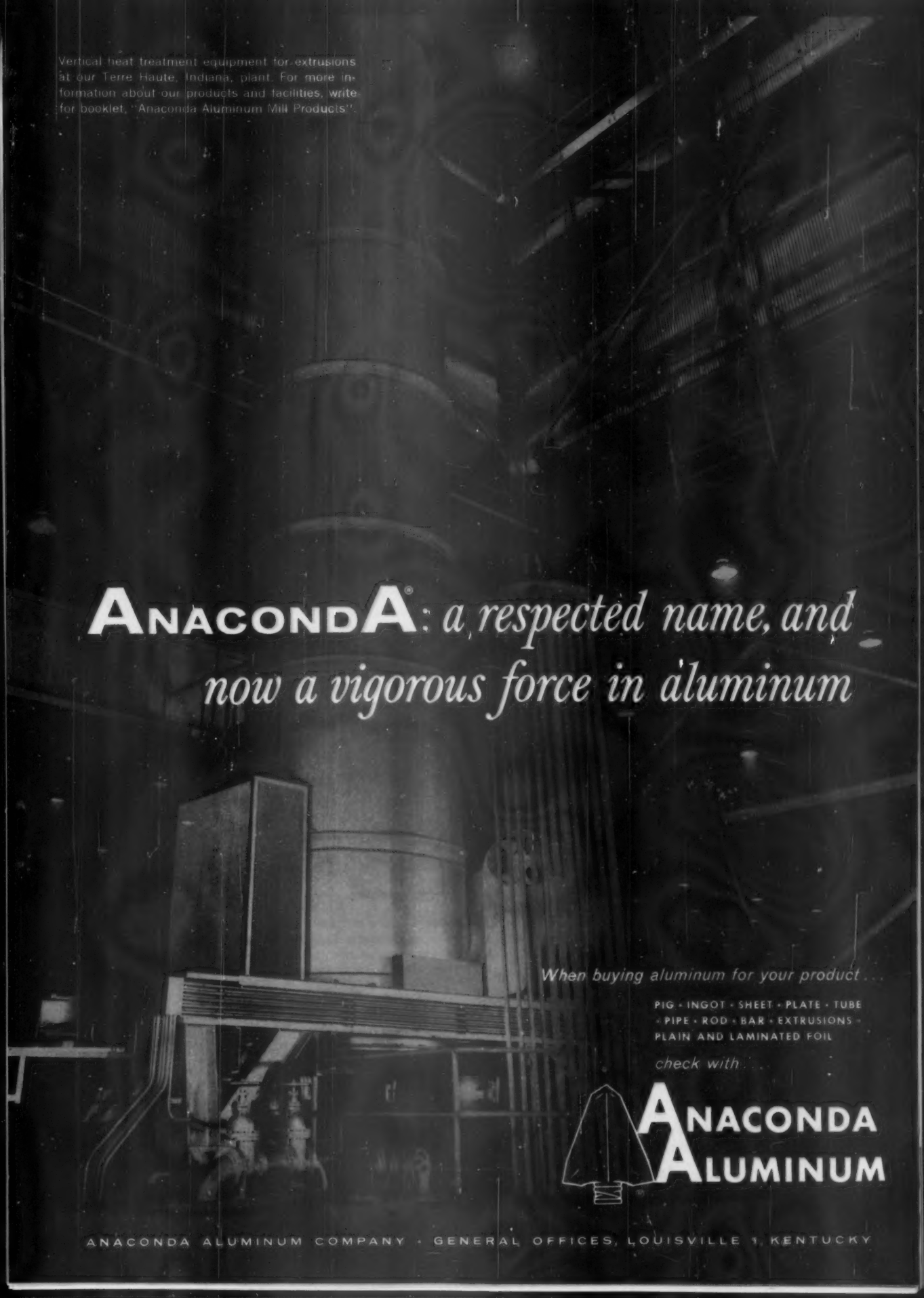
National PRODUCTS

The National Screw & Mfg. Company · Cleveland 4, Ohio

California Division, The National Screw & Mfg. Company • 3423 South Garfield Avenue, Los Angeles 22, California

For More Facts Write No. 181 on Information Card—Page 32

For More Facts About Ad on Facing Page Write in No. 182→


Vertical heat treatment equipment for extrusions at our Terre Haute, Indiana, plant. For more information about our products and facilities, write for booklet, "Anaconda Aluminum Mill Products".
ANACONDA®: a respected name, and now a vigorous force in aluminum
When buying aluminum for your product . . .
PIG • INGOT • SHEET • PLATE • TUBE • PIPE • ROD • BAR • EXTRUSIONS • PLAIN AND LAMINATED FOIL
check with
ANACONDA ALUMINUM
ANACONDA ALUMINUM COMPANY • GENERAL OFFICES, LOUISVILLE 1, KENTUCKY

Information For Your Catalog Files

ASBESTOS FIBRE

A booklet describing test procedures for evaluating asbestos fibre. The 18-page brochure gives information for determining characteristics in commercial grades. Gives evaluations of length, bulk, viscosity, air permeability, oil absorption, color, moisture, and magnetic rating.

American Smelting and Refining Company

Write No. 1 on Information Card—Page 32

BARREL FINISHING MACHINES

A four-page brochure on barrel finishing machines. Includes specifications, data, and illustrations on models for deburring, deflashing, grinding, descaling, polishing, burnishing, and drying unfinished parts.

Syntron Company

Write No. 2 on Information Card—Page 32

CASTERS

Form No. 91560 describes a line of industrial casters. The four-page folder illustrates general-duty, light-duty, medium-duty, medium-heavy-duty, extra-heavy-duty, and super-heavy-duty casters. Also covers four special application casters (V-groove, spring-action, grease-sealed, and scaffold) and seven types of wheels.

Faultless Caster Corporation

Write No. 3 on Information Card—Page 32

ELECTRONICS

A handbook covering the application of electric and electronic controls. The illustrated booklet makes comparisons between electronic and pneumatic controls. Information is primarly directed to heating, ventilating, and air conditioning applications.

Barber-Colman Company

Write No. 4 on Information Card—Page 32

ELECTROPLATING

A two-color, 24-page bulletin on electroplating processes. Includes three new nickel processes: Levelume, Permalume, and Superlume. Describes laboratory, testing, and field services.

Hanson-Van Winkle-Munning Company

Write No. 5 on Information Card—Page 32

GOVERNORS

Bulletin 114 describes governors designed for maximum sensitivity at extremely low pressures. The four-page catalog lists major operating and design features. Weights, dimensions, capacities, spring recommendations, and ordering information are provided in tabular form. Cutaway illustrations show the interior construction of the small, large, and six-inch sizes.

American Meter Company

Write No. 6 on Information Card—Page 32

HORIZONTAL CONVEYORS

Bulletin #19-1200 describes and illustrates five types of horizontal power conveyors. The eight-page, two-color catalog has products and installation photographs. Includes specifications for all types—covering standard lengths, widths, speeds, and horsepower requirements.

Rapids-Standard Co., Inc.

Write No. 7 on Information Card—Page 32

INDUSTRIAL HOSE

Bulletin #627 covers industrial hose style selection. The 12-page booklet lists the type of hose required for separate liquids and gases. Suitability of tubestocks for use in carrying these agents is charted in four classifications: excellent, good, conditional, and unsatisfactory.

Aeroquip Corporation

Write No. 8 on Information Card—Page 32

MOTORS

Bulletin No. 6100.1 describes design features, performance characteristics, and size ranges of a line of squirrel cage induction motors. The eight-page, two-color catalog contains photographs, specifications, and cutaway drawings.

Lincoln Electric Company

Write No. 9 on Information Card—Page 32

MOUNTED DRIVES

Bulletin 7100 covers shaft and flange mounted drives. The 34-page catalog contains photographs, selection tables, and dimensions.

Falk Corporation

Write No. 10 on Information Card—Page 32

PLASTICS

A 20-page booklet entitled "Quality Plastics for Quality Products" describes many general-purpose resins, latices, and compounds. Covers hi-temp Geon, Abson materials, Estane polyurethane, and Polyblend 503H.

B. F. Goodrich Chemical Company

Write No. 11 on Information Card—Page 32

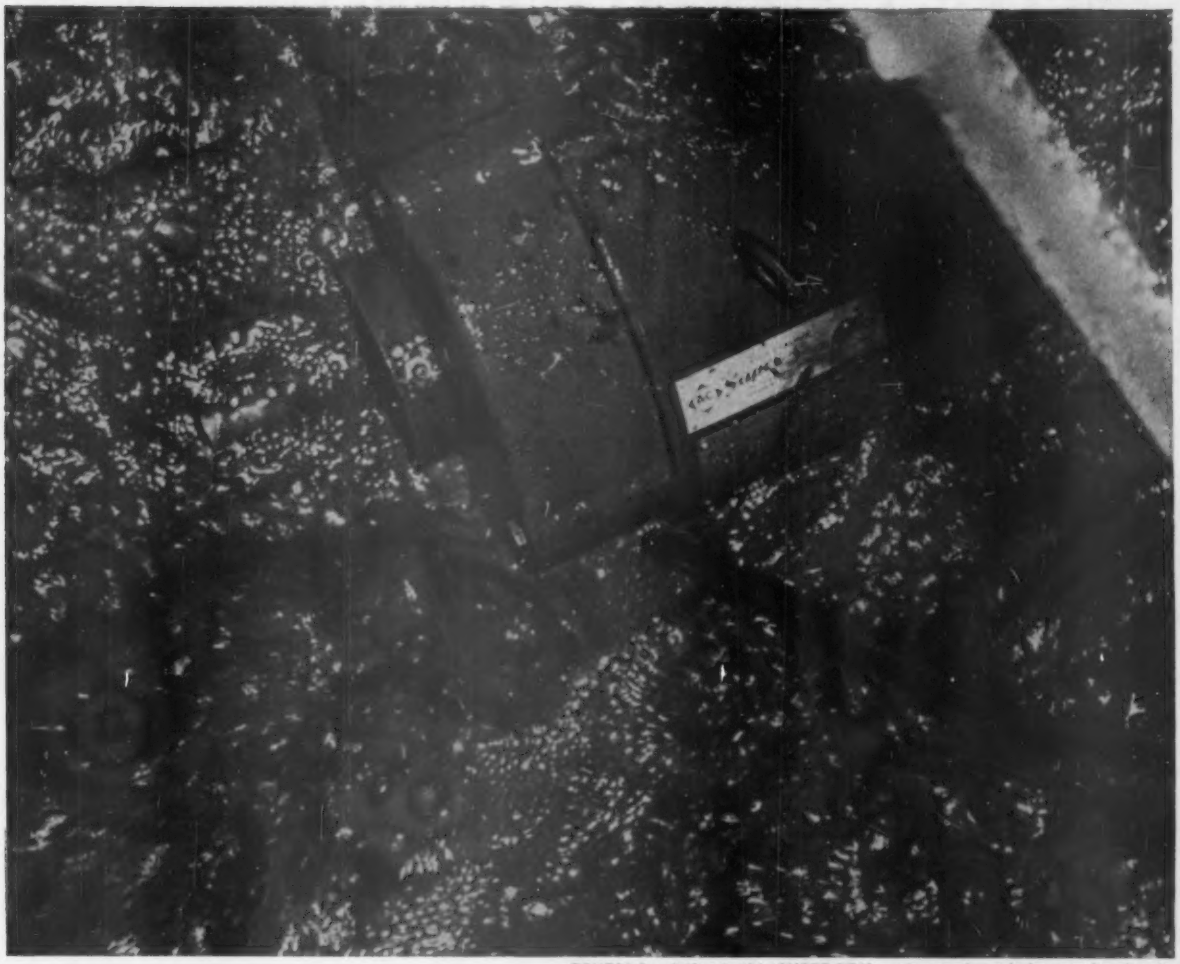
SAFETY EQUIPMENT

Catalog No. S-37 covers 57 eye and face protection products and accessories. The 16-page illustrated bulletin gives information on lenses, replacement parts, and goggle cases.

Sellstrom Manufacturing Co.

Write No. 12 on Information Card—Page 32

ALLIS-CHALMERS



POXEAL insulation in this SUPER-SEAL motor needs no bake-out after floods.

Here's an open motor that shrugs off flood damage! Proof of

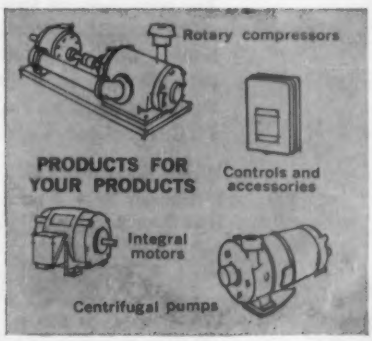
O.E.M.pathy*

***O.E.M.pathy . . . a unique form of empathy . . . the sensitivity to understand and to react to the problems of Original Equipment Manufacturers.** Because we are an OEM ourselves, we have this sensitivity. It means, "We give what we'd like to receive."

In terms of research, O.E.M.pathy results in unusually good components . . . like the motor shown above. It produces components that improve your product's performance and salability, saves time and reduces service needs. O.E.M.pathy also means regional stocking near your plant, complete product lines and competent service of national scope.

It's more than a desire to serve. It's the proven ability to serve you as an OEM. At Allis-Chalmers, we want your components business. We'll work to get it and we'll work to keep it. **Allis-Chalmers,** *Industrial Equipment Division, Milwaukee 1, Wisconsin.* A-1340

Poxeal and Super-Seal are Allis-Chalmers trademarks.



For More Facts Write No. 183 on Information Card—Page 32

"CALL FOSTER... THEY'LL SHIP PIPE PLUS"



Right! Whether it's a routine order or an emergency request for unusual or hard-to-get sizes, Foster gives you pipe *"plus."*

You get all your pipe when and where you need it, cut to length or fabricated in complete-package shipments, at lowest possible cost.

For non-pressure applications, check the unusual savings on Foster Structural Pipe. Foster's nationwide warehouses stock Tested & Structural Steel Pipe, 1/8" through 48" in all sizes and walls—*"plus"* Stainless, Seamless, Alloy, Pressure, Aluminum, Wrought Iron, PVC Pipe and Valves, Fittings, Flanges.

Write L. B. FOSTER CO. for latest Stock List PA-12

Pittsburgh 30 • New York 7 • Chicago 4 • Cleveland 35
Houston 2 • Los Angeles 5 • Atlanta 8



Faster From Foster

PIPE • PILING • RAIL

For More Facts Write No. 184 on Information Card—Page 32

Catalog Files

SILICON RECTIFIERS

A four-color, folder-type brochure on silicon rectifiers. Gives ratings and specifications for top hat, stud, insulated stud, plug-in tube replacement, and special purpose rectifiers. Includes application and design notes and circuit design constants.

Semicon Inc.

Write No. 13 on Information Card—Page 32

SINTERING

Bulletin No. 603 covers sintering. The 16-page catalog describes the advantages, physical properties, and applications of powdered metal parts. Also discusses design principles and illustrates different types of furnaces.

Electric Furnace Co.

Write No. 14 on Information Card—Page 32

SPROCKETS

Book 2867 describes stock sizes of cast-tooth sprockets. The 12-page catalog lists 132 different chain numbers, which are cross-referenced to 48 sprocket lists.

Link-Belt Company

Write No. 15 on Information Card—Page 32

STEEL

A 42-page catalog on steels for low temperature applications. Contains photographs, graphs, chemical requirements, and design data. Includes information on 2¼%, 3½%, and 9% nickel steel.

United States Steel Corporation

Write No. 16 on Information Card—Page 32

SWITCHES

Data Sheet No. 180 covers high sensitivity subminiature switches. Includes mounting dimensions, operating characteristics, electrical ratings, and pricing information.

Minneapolis-Honeywell Regulator Co.

Write No. 17 on Information Card—Page 32

For More Facts About Ad on Facing Page Write in No. 185→



Now reduce aisles to 6′–capture ←36%→ "lost" storage space – as Glidden did!

By purchasing the Towmotor "Naro-Aisle-Stack" Series fork lift truck pictured above, The Glidden Company realized an immediate 36.8% gain in storage capacity at their Reading, Pa. warehouse.

Reducing 9′ 6″ wide aisles to six feet enabled the new lift truck—which stacks heavy loads 90° left or right in the narrow aisles—to bring Glidden many other advantages as well. Now 42% more Glidden products are warehoused. Order filling and shipping are expedited. And the cost of additional warehouse facilities was averted.

Find out how this new "Naro-Aisle-Stack" Series truck can save *your* space, time and dollars as it has for The Glidden Company. Write for new booklet, "Captures Lost Space." TOWMOTOR CORPORATION, CLEVELAND 10, OHIO.

NEW "NARO-AISLE-STACK" SERIES FORK LIFT TRUCKS DESIGNED AND BUILT BY...

TOWMOTOR
THE ONE MAN GANG
GERLINGER

FORK LIFT TRUCKS, CARRIERS AND TRACTORS SINCE 1919

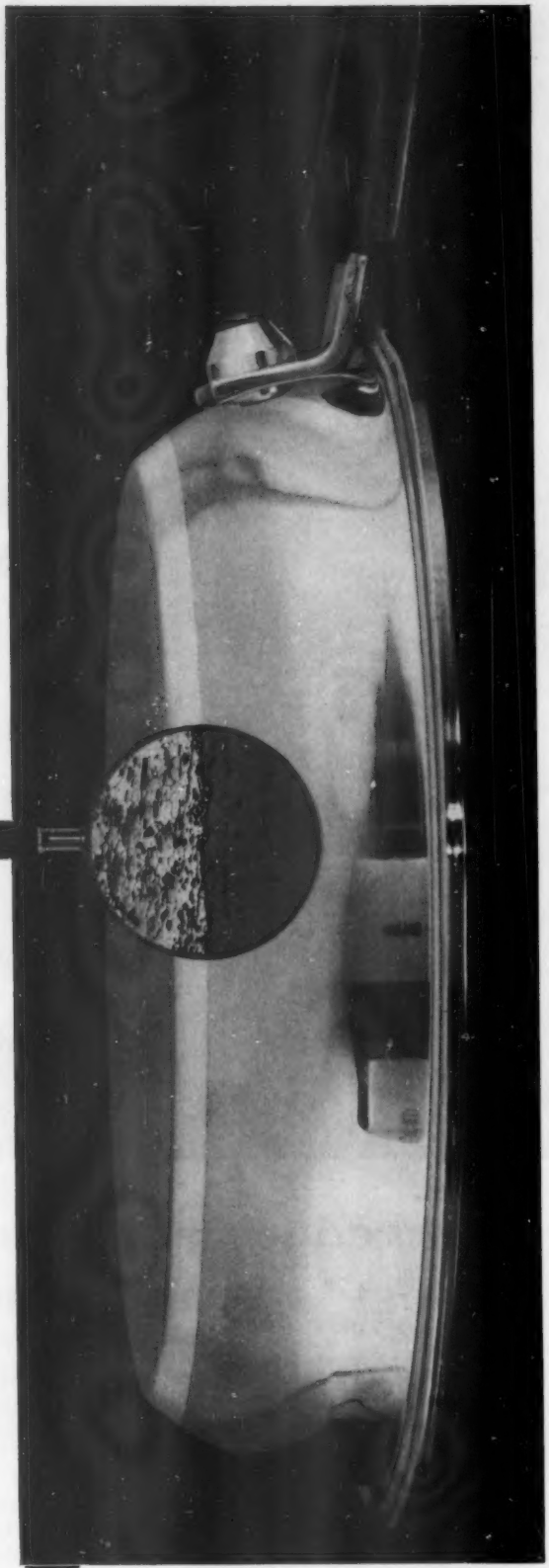
Gerlinger Carrier Co. is a subsidiary of Towmotor Corporation



Alcoa pressure-bonds

ALUMINUM TO STAINLESS

for the advantages of both!



Buckeye Division of Mardigian Corporation designs fast, even heating—easy cleaning into its new "Cordon Bleu" cookware line

Alcoa pressure bonding inspired an entirely new line of quality cookware by the Buckeye Division of Mardigian Corporation. "Cordon Bleu" gains the advantages of *both* metals: aluminum's high conductivity, corrosion resistance and light weight; the strength and density of stainless.

Heat and pressure combine to adhere aluminum to stainless in a die without flux or molten metal. The result is a bond of strength, ductility and integrity.

Alcoa's patented process forges many bimetallic unions: aluminum to carbon and alloy steels, to copper, to alloys of itself. Complex shapes are no longer a problem. Here disks cut from aluminum plate flowed up and around radii during bonding. Other processes start with cast aluminum slugs.

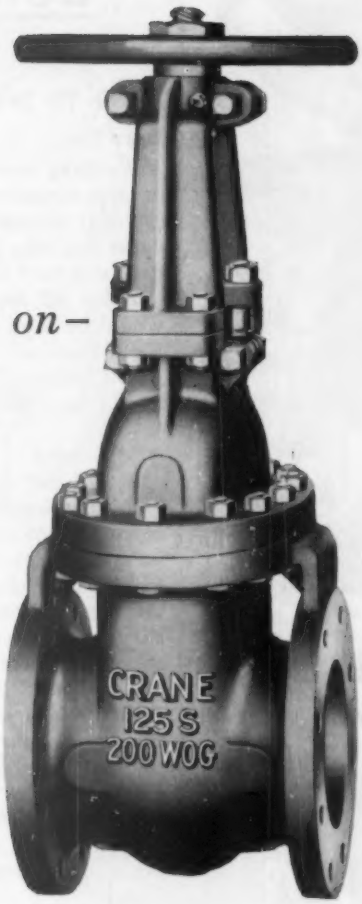
Design possibilities abound for this unique pressure-bonding technique. Want more data, design help, feasibility evaluation? Call on your nearest Alcoa sales office, or write: Aluminum Company of America, 906-M Alcoa Building, Pittsburgh 19, Pa.

ALCOA ALUMINUM

ALUMINUM COMPANY OF AMERICA

For More Facts Write No. 186 on Information Card—Page 32

The valves most plants rely on–



No. 465½,
125-pound iron body
gate, bronze trimmed.
Sizes 2" to 48".

CRANE 125-POUND IRON BODY GATES

On general utility services . . . water mains and distribution lines . . . low-pressure steam and hot water . . . air and gas . . . more plants rely on Crane No. 465½ iron body bronze trimmed gates than on any other valve in this class.

Crane iron gates are an up-to-date design with service-proved features. A two-piece, ball-type packing gland for bind-proof packing adjustment . . . shoulder-type seat rings that won't loosen . . . extra-long disc guides to minimize drag on seating faces. All features are carefully planned to yield long, dependable operating life.

To enable you to standardize on these economical, efficient valves, Crane builds them in a full range of sizes. Popular sizes are available from local stocks of your Crane Distributor.

CRANE®

Crane Co., Industrial Products Group, 4100 S. Kedzie Ave., Chicago 32, Illinois

VALVES · ELECTRONIC CONTROLS · PIPING · PLUMBING · HEATING · AIR CONDITIONING

For More Facts Write No. 187 on Information Card—Page 32



Rope Wire • Hose Wire
Fuse Wire • Lamp Wire
Pin Ticket • Match Wire
Bonnet Wire • Steel Heddle
Spiral Binding Wire • Box Stay Wire
Bookbinders Wire • Stapling Wire
Tin Shaft Wire • Glass Netting Wire
Tinned Covering Wire • Hair Pin Wire
Tinned Anneal Tag Wire • Weaving Wire
Filler Wire • Ring Traveler • Mandrel Wire • Tea Bag Wire • Stitching Wire
Liquor Stapling Wire—Brush.

Specialty Wire... our cup of tea

Problem: Staple the tea bag to the string and the string to the trademark tab. Make the attachment tear-proof and keep stapling machines running smoothly. Meet strict Government regulations envolving cleanliness of wire, metallic content and corrosion factors.

Answer: Call Prentiss. This major tea firm did. Now, "being in hot water" is no problem at all. Write, call or wire: Prentiss Works, *Riverside-Alloy Metal Division, H. K. Porter Company, Inc., Holyoke, Mass.*

RIVERSIDE-ALLOY METAL DIVISION

PORTER

H. K. PORTER COMPANY, INC.

PORTER SERVES INDUSTRY with steel, rubber and friction products, asbestos textiles, high voltage electrical equipment, electrical wire and cable, wiring systems, motors, fans, blowers, specialty alloys, paints, refractories, tools, forgings and pipe fittings, roll formings and stampings, wire rope and strand.

For More Facts Write No. 188 on Information Card—Page 32

Letters To The Editor

SPEND TO SAVE

Dear Sir:

We have been looking for data on the national average of cost savings produced against total value analysis budgets. Also, any data you may have on compensation for all levels of purchasing would be most helpful.

H. F. Banzhaf
Allis-Chalmers Manufacturing Co.
Milwaukee, Wisc.

• *We know of no national averages but our studies in all types of companies in all parts of the country seem to indicate that value analysis will produce about $10 in cost reduction for every $1 invested.* A PURCHASING Magazine *survey indicates that the average company pays it's purchasing agent about $12,000 a year. Materials managers rarely make less than this figure and the upper limits can be quite high. Most big companies pay buyers between $500 and $900 per month—although highly skilled buyers and those with long service may go higher.*

A BIT OF HISTORY

Dear Sir:

Recent disclosures of influence-peddling and private profiteering have focused a good deal of public attention on the conduct of executives in business and government, and on none more than in the field of purchasing. We get the general impression that business ethics, public and private, are showing signs of atrophy.

Perhaps it might be good for our perspective to throw a little historical light on the subject. In the third and fourth centuries A. D., the Roman Empire consisted of 116 provinces, each under the administration of a governor. Constantine and his successors, obviously impelled by malfeasance among their subordinates, established stringent rules for the governors of the provinces. No man could become governor of his native province; upon becoming governor, neither he nor any of his sons could marry a native of the province which he governed. Neither was he allowed to own property within the confines of his province.

Compared with these restrictions, today's rules are liberal indeed. On the premise that such restrictions reflect a need for such close supervision, humanity appears to have made some progress in the struggle with its nature. At least, it is some consolation to know that the problem is not unique to our generation.

Lynn Harrington
Purchasing Agent
The Norwich Pharmacal Company
Norwich, N. Y.

PURCHASING MANUAL

Dear Sir:

Would appreciate any information, leads, etc., in connection with setting up a purchasing department manual which covers not only purchasing, but material control as well.

L. D. Fairbanks
Materials Manager
Yale & Towne Manufacturing Co.
Batavia, New York

• *We have reprinted Mr. Fairbanks' letter as a means of asking if any of our readers can help. You may send your manuals directly to Mr. Fairbanks or to* PURCHASING *Magazine; we will be pleased to forward them on to him.*

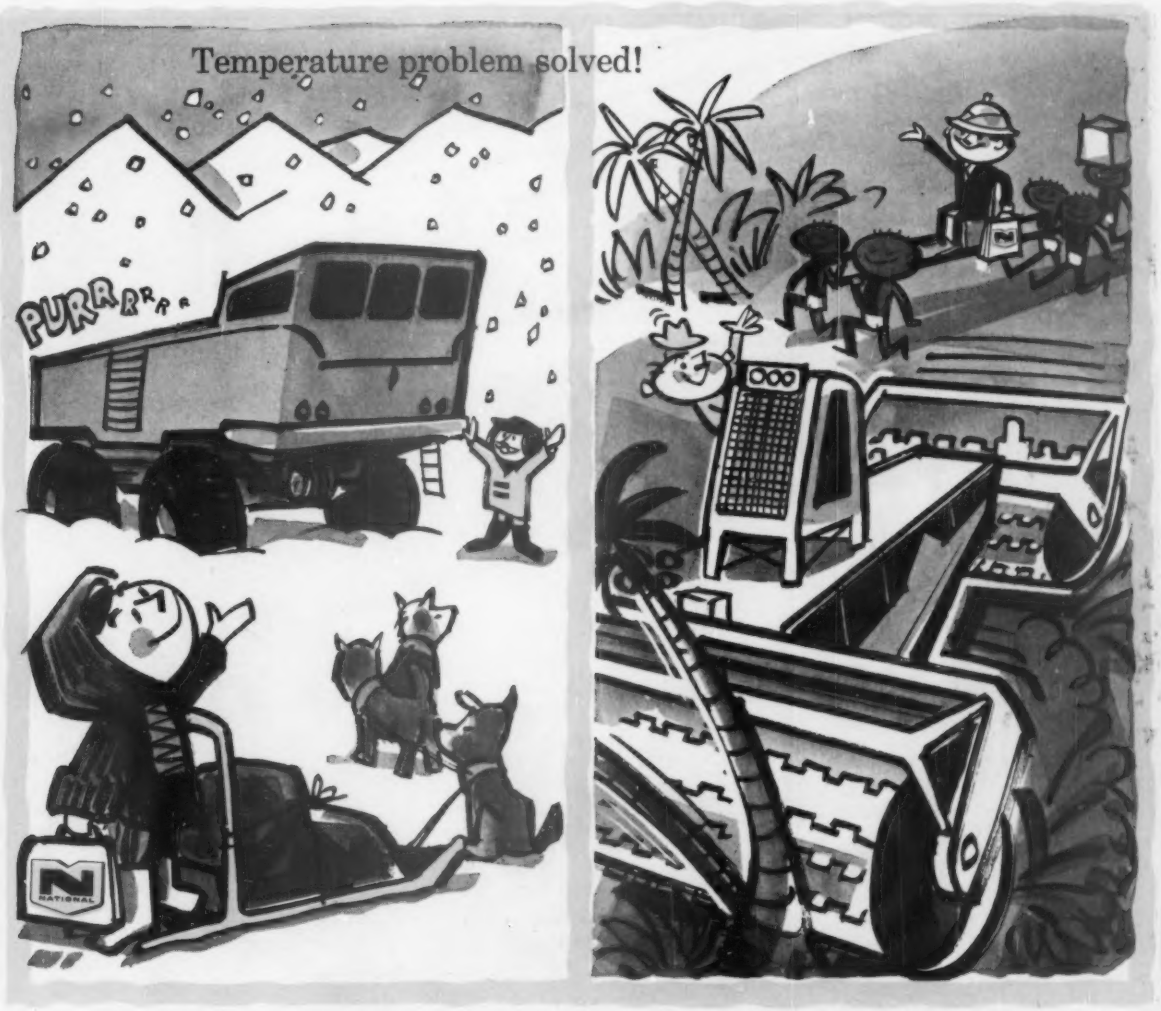
TOPS IN VALUE ANALYSIS

Dear Sir:

I want to compliment you on the excellent value analysis coverage in the October 10 issue.

This is, of course, just one of many issues in which our favorite subject has been well covered and we appreciate the amount of space you continue to devote to this important facet of purchasing.

Kenneth A. Cruise
National Chairman
Committee on Value
Analysis-Standardization



Idling at 70° below zero—or pushing at 127°

one NATIONAL brush fits both jobs!

TRADE-MARK



H. H. FRASCH

PROBLEM: This earth-moving equipment operated in rugged terrain where temperatures might vary 200 degrees.

RECOMMENDATION: Henry Frasch and the manufacturer agreed on "National" Brush Grade SA-45.

RESULTS: Excellent cold weather and tropical performance even where commutator speeds reach 5,000 RPM.



Contact your "National" Brush Man

"National", "N" and Shield Device, and "Union Carbide" are registered trade-marks for products of

NATIONAL CARBON COMPANY
Division of Union Carbide Corporation • 270 Park Avenue, New York 17, New York
IN CANADA: Union Carbide Canada Limited, Toronto

UNION CARBIDE

For More Facts Write No. 189 on Information Card—Page 32



When towels come one at a time they all get used



NEW Steiner Serva-Matic dispenser delivers one unfolded paper towel at a time. No buttons, cranks, levers or tear off required.

A few seconds will elapse before the next towel comes out of this Steiner automatic dispenser. Means the first towel will be used before the second can be taken. When this happens every time someone dries his hands you can see the result: Fewer towels are used . . . waste is reduced . . . towel costs go down (as much as 30%). All Steiner cabinets have an adjustable control you can set to dispense towels at the rate you want . . . at the best rate to keep washroom traffic moving and to keep employees and customers satisfied. For details write . . .

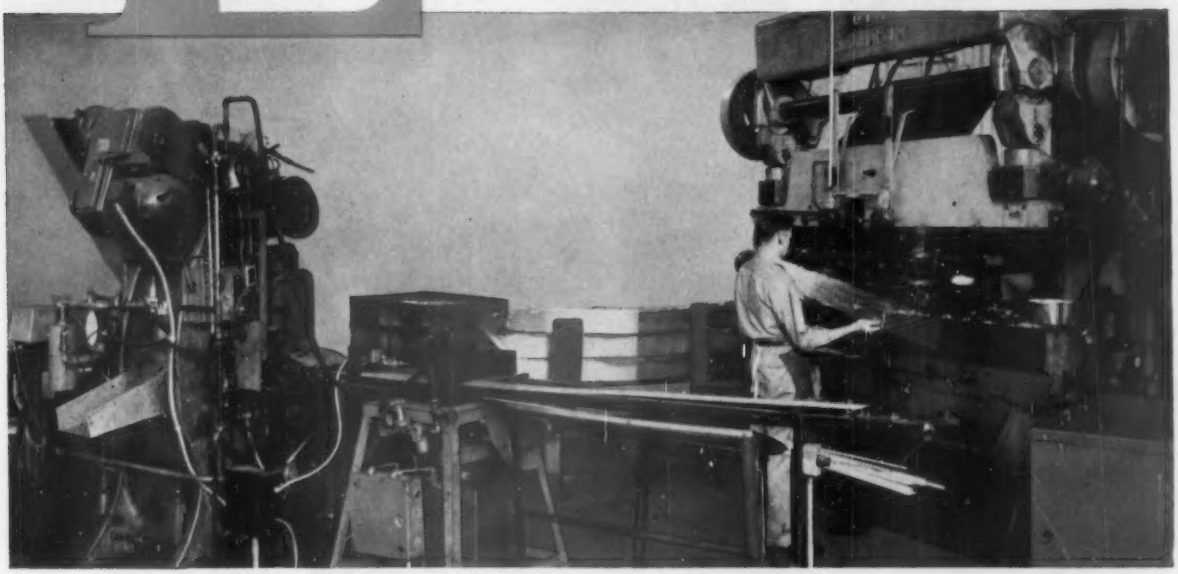
STEINER

STEINER COMPANY

Dept. 60-5, 740 Rush Street • Chicago 11, Illinois

For More Facts Write No. 190 on Information Card—Page 32

E is for EFFICIENCY and ECONOMY



E

Efficient operation is the straight road to economy. And economy in *our* plant cuts *your* cost of production.

At MIRRO, high-speed, automatic equipment lets us turn out *more* work with *less* work—and at a reject rate that's almost disappeared off the bottom of the chart. In the unit above, for example, feed, perforation, and cutoff operations are combined, to supply a single operator with prepared sheet for final forming. This is only one of many machines that make MIRRO a highly efficient and economical source for volume quantities of aluminum components.

Phone, wire, or write for more information about how we can help you do *your* job better, for less.

MIRRO
THE FINEST ALUMINUM



ALUMINUM COMPONENTS
CUT THE COST OF QUALITY

MIRRO ALUMINUM COMPANY • MANITOWOC, WISCONSIN • Fifth Avenue Bldg., New York 10 • Merchandise Mart, Chicago 54

For More Facts Write No. 191 on Information Card—Page 32

"RIGHT HERE IN THE OPEN HEARTH SHOP, I CAN SEE GRANITE CITY GROWING"



"I guess I'm about as close to where steel begins as you can get—third helper on Number 21 open hearth furnace. On the next shift they'll tap 500 tons of steel from this furnace. That's twice as much as we used to tap. We doubled its capacity by putting in a bigger hearth, a basic roof and larger charging doors. And we are using more oxygen to speed melting and refining. Since I started here 10 years ago, our ingot capacity has doubled."

SINCE 1878
GRANITE CITY STEEL ®

GRANITE CITY STEEL

STEELMAKERS TO MIDDLE AMERICA

HOME OFFICE: Granite City, Illinois • SALES OFFICES: Dallas • Memphis
Kansas City • St. Louis • Minneapolis • Houston • Moline • Tulsa

Steel

For More Facts Write No. 192 on Information Card—Page 32

Purchasing People In The News

The Colorado Fuel and Iron Corporation has announced the transfer of its **Buffalo** purchasing department to **Trenton, N. J.** Effective now purchasing for the offices and plants within the Eastern division, Wickwire and Roebling, will be under the supervision of **A. R. Kinney**, director of purchases and **K. S. Dickel**, now purchasing agent for the Eastern division, including Roebling. The new headquarters will be located at 640 South Broad Street, P. O. Box 321, Trenton.

Alan B. Grover became purchasing agent for **Sperry Products Company**, a division of **Howe**



Alan B. Grover

Sound Company, Danbury, Conn. Mr. Grover joined Sperry in 1948 and has been a buyer since 1953.

Clarence M. Oberling has retired as purchasing agent of the **National Lock Company, Rockford, Ill.** Mr. Oberling has had 23 years of service with the company.

California Texas Oil Corporation, New York City has named **J. F. Gleason** manager of purchasing. He succeeds **D. G. Schnabel** who has retired. Prior to his present appointment, Mr. Gleason was manager of purchasing for Caltex Services Limited, London. He joined Caltex in 1945.

James J. Phelan has been appointed purchasing agent of **The Thomas & Betts Co., Elizabeth,**



James J. Phelan

N. J. He has been assistant purchasing agent since 1958.

Richard Wells has been appointed purchasing agent of the **Columbia Steel and Shafting Company, Carnegie, Pa.** He has been a member of the sales department, and has been with the purchasing department since 1956. He has



Richard Wells

studied metallurgy as an extension student of the Pennsylvania State University, and business administration at the Robert Morris School of Business in Pittsburgh.

Leonard B. Bielawski has been named director of purchases, **Board of Wayne County Auditors, Wayne County, Mich.** He succeeds **Charles F. McCauley** who has retired. Mr. Bielawski will direct the purchasing of all county departments, with the exception of the Wayne County Road Commission. He has been asssistant director of purchases for the county since 1942. He attended Wayne University and is a member of the Public Relations and Publicity Committee of the Detroit Purchasing Agents Association.

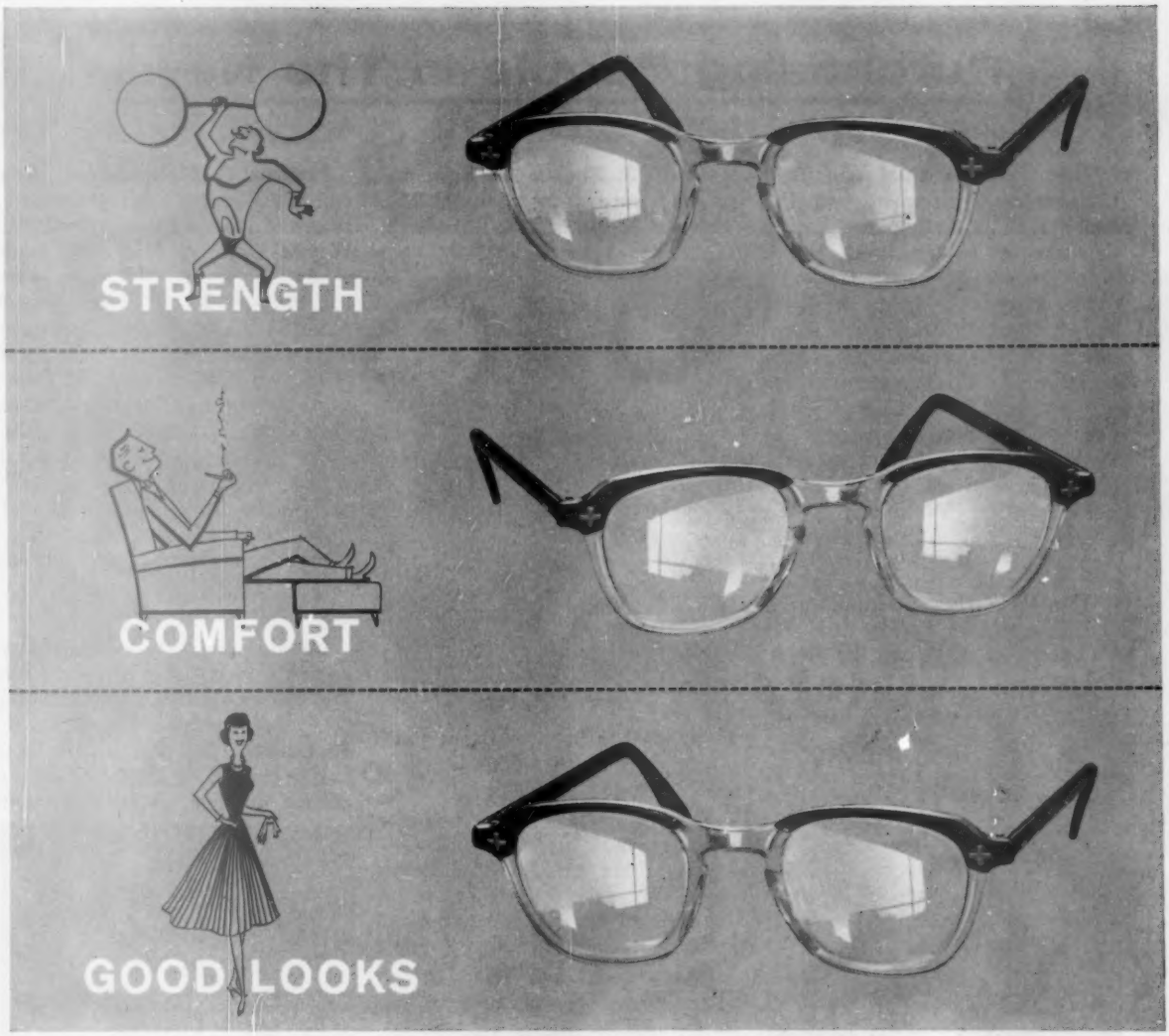
Donald A. Leslie has been named director of purchasing for **The Coca-Cola Company, Atlanta, Ga.** He succeeds **Homer B. Thompson,** who has retired. Mr. Leslie started in Fountain Sales in 1933. In 1936 he was promoted



Donald A. Leslie

to manager of the dispenser department and in 1943 was made head of the equipment section of bottler sales promotion. He organized and headed the Allotment Division of the company before becoming manager of the purchasing department and assistant director of purchasing in 1946. Mr. Leslie is a member of the Georgia Purchasing Agents Association. He attended the Graduate School of Business of Columbia University and is a graduate of Denison University.

(Continued on page 168)



EYES THREE WAYS SAFER...In B&L

Acetate Safety Frames for men and women

1 *Safer because they're stronger!* 77% greater modulus of elasticity than the molded butyrate used in most ordinary safety frames. 53% greater flexural strength. 21% harder in Rockwell R scale. That's because B&L uses only the finest quality acetate, with every operation —melting, compounding, extrusion, cutting—performed in the B&L plant, under B&L critical control. The material itself is stronger, and there's *extra* strength in the bridge, temples and endpieces; *extra* strength in the eyewires to lock impact-resistant Bal-SAFE lenses in place.

2 *Safer because they're more comfortable!* You can assure perfect non-slipping fit with choice of rigid or adjustable nose pads . . . spatula or cable temples . . . complete range of eye, bridge and temple sizes.

3 *Safer because they're more attractive!* Trimly profiled in high-lustre tones of flesh or brown, and in the popular two-tone styling. Workers will wear them because they look good in them.

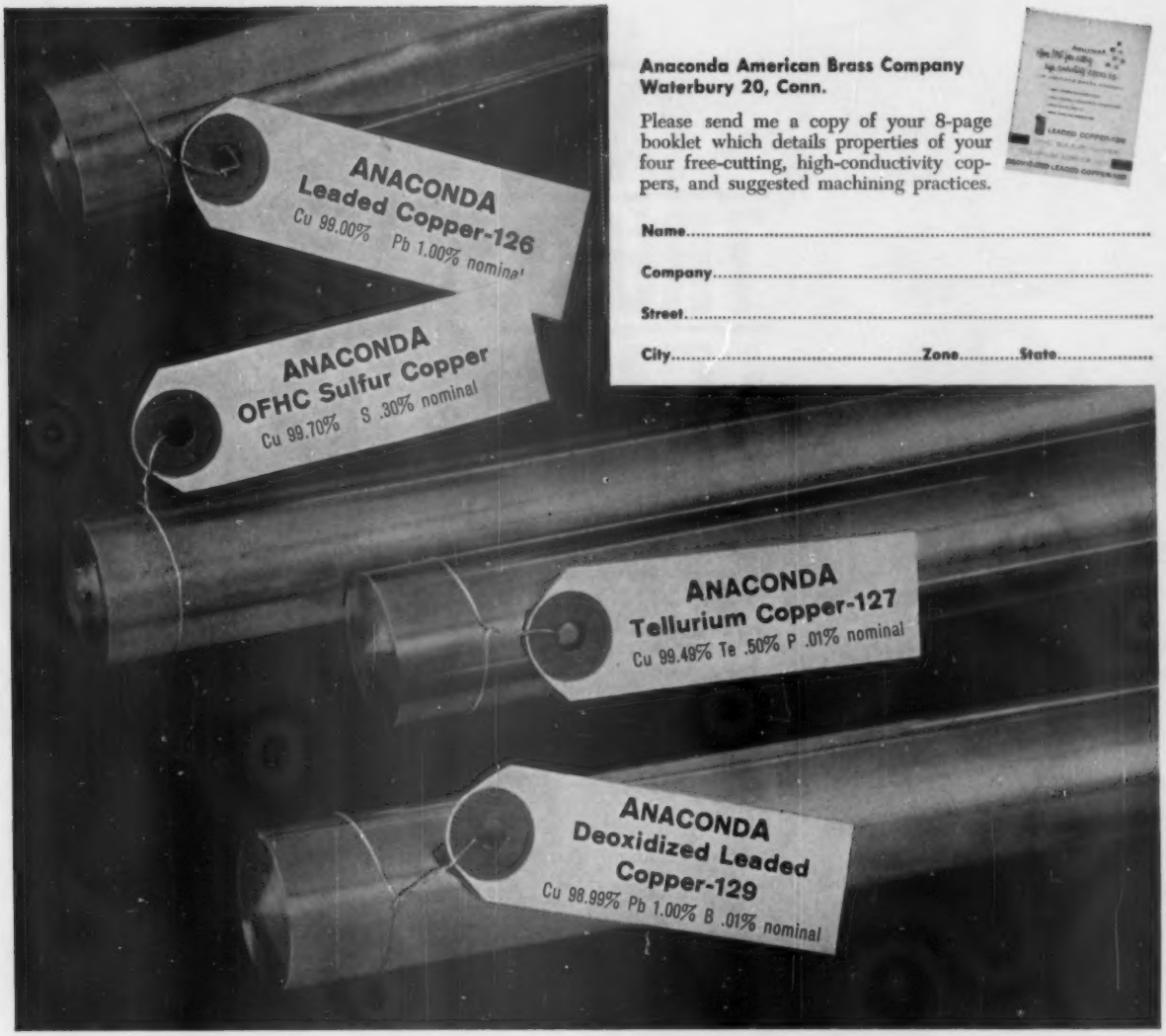
The B&L complete line assures you the perfect fit for each worker. And for *complete* protection: Redy-Fit Side Shields, available as part of the frame or as interchangeable units. Check with your B&L supplier, or drop a line to Bausch & Lomb Incorporated, 90612 Lomb Park, Rochester 2, New York.

BAUSCH & LOMB

Protection PLUS Safety Products

protection + economy + worker acceptance

For More Facts Write No. 193 on Information Card—Page 32



Anaconda American Brass Company
Waterbury 20, Conn.

Please send me a copy of your 8-page booklet which details properties of your four free-cutting, high-conductivity coppers, and suggested machining practices.

Name.....

Company.....

Street.....

City.....**Zone**.....**State**.....

4 ways to cut the cost of high-conductivity parts

There are now four free-cutting, high-conductivity Anaconda coppers that broaden the combinations of mechanical, physical, and fabricating properties available for boosting production and cutting costs of high-conductivity parts. They are furnished chiefly in rod and bar, but are available also as extruded shapes and, except for the leaded coppers, die-pressed forgings of simple design. All have good cold-working properties.

Leaded Copper-126 and Deoxidized Leaded Copper-129 have slightly higher electrical conductivity—98% IACS annealed, 95% IACS, minimum. The difference between them is that Alloy 129, being deoxidized, is not subject to hydrogen embrittlement when annealed or furnace-brazed in reducing atmospheres. Neither leaded alloy is recommended for hot working.

Tellurium Copper-127 and OFHC* Sulfur Copper have an electrical conductivity rating of 95% IACS annealed, 90% minimum. Both may be extensively hot worked and neither is subject to hydrogen embrittlement. Tellurium Copper-127 has the advantage of retaining its mechanical properties at temperatures higher than those tolerated by the other free-cutting coppers—and hence is widely used in the welding and cutting-tip field.

The free-cutting coppers may be machined at cutting speeds approaching those used for machining Free-Cutting Brass. For Tellurium Copper-127, however, carbide-tipped tools are recommended as the inherent copper telluride particles cause somewhat greater tool wear. *Registered Trademark of American Metal Climax, Inc. 6047 Rev. L

ANACONDA®

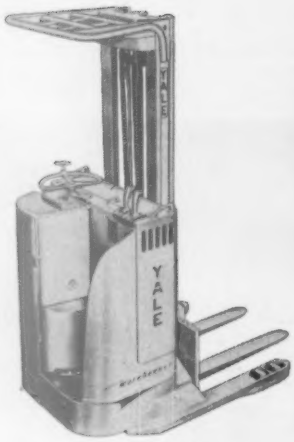
FREE-CUTTING HIGH-CONDUCTIVITY COPPER PRODUCTS

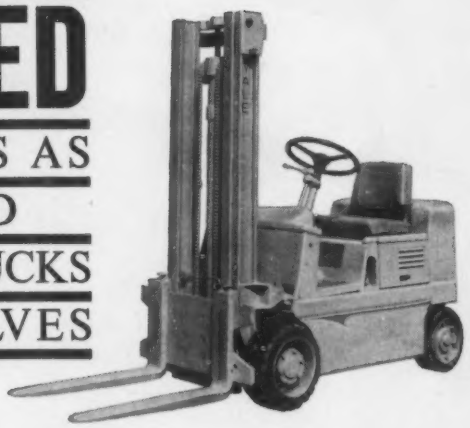
Anaconda American Brass Company

For More Facts Write No. 194 on Information Card—Page 32

YALE TRUCKS LEASED

ON PLANS AS VARIED AS THE TRUCKS THEMSELVES





One of the following Four Flexible Finance Plans will put any Yale Truck to work earning profits for you immediately. The advantages of each plan, outlined here, will help you decide which plan best meets your requirements. Look them over.

Time Payment Plan. Under this plan you make a small down payment and the truck is delivered. Thereafter you make monthly payments adjusted, within reasonable limits, to your requirements.

1

2 **Leasing Plan.** Under this plan you can lease a Yale gas or electric truck for a period up to 5 years with renewal options available for additional periods. Rates of payments are flexible to meet your needs.

Leasing Plan with Purchase Option. Under this plan you get the advantages of a straight leasing plan on pre-arranged monthly payments. But you can arrange for title of ownership to the truck by paying a small additional sum at the end of the lease.

3

4 **Leasing Plan with Maintenance.** Under this plan you can lease a Yale truck on terms outlined in Plan 2 or 3. But for an additional sum you can obtain full maintenance including all repairs, replacement of parts, and labor costs.

These Four Flexible Finance Plans represent the basic financial terms under which Yale trucks are leased. However, if you are confronted with unusual circumstances, we will make every effort to arrange a special plan "tailored" to your specific needs. But whichever Yale plan you decide upon, remember that you will have the best in lift truck equipment powered by gas, electricity, Diesel or LP gas. For more information write to your nearest Yale dealer or to us direct.
Yale Materials Handling Division, a Division of the Yale & Towne Manufacturing Company, Dept. X-010, Philadelphia 15, Pa.

YALE®
INDUSTRIAL LIFT TRUCKS
TRACTOR SHOVELS · HOISTS
YALE & TOWNE

For More Facts Write No. 195 on Information Card—Page 32

For More Facts About Ad on Facing Page Write in No. 196→

so quiet...



. . . not even a purr! It's this traditional quietness of Hoover ball bearings that best demonstrates *Hoover Quality* . . . your assurance of longer life, superior performance.

Hoover-Honed raceways are super-smooth, finished to microscopic accuracy. *Micro-Velvet* balls are accurate within millionths of an inch. Precision assembly is achieved through perfect matching of ball complements and raceways. When specifications call for finest quality specify *Hoover Quality* bearings. There is a wide range of types and sizes. Contact your local Hoover bearing specialist, listed in the Yellow Page Directory, or write to us.

Hoover-Honed and *Micro-Velvet* are Hoover Trademarks.

hoover

BALL AND BEARING COMPANY

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Zone Sales Offices and Warehouses

8581 South Chicago Ave., Chicago 17, Illinois
290 Lodi Street, Hackensack, New Jersey
2020 South Figueroa, Los Angeles 7, California

"...love that fast chart delivery!"



"I never run short on recording charts any more because GC gives me the fastest service on the broadest range of charts."

The heart of the GC delivery story is speed—and there are two good reasons why:

1. WE STOCK MORE CHARTS. Our inventory of 8,100,000 charts fills four miles of shelf space and is kept current by our electronic data processing system. Most of the 15,000 items in the GC Stock List are here — circular, strip and rectangular charts—ready for off-the-shelf delivery to you.

2. WE PROCESS YOUR ORDER FASTER with the most advanced electronic data processing system in the industry. Most stock orders get 48-72 hour service. And no one else can match our speed in producing charts to meet your "special" requirements.

Ask for our stock list. Ask for specific sample charts to try on your own instruments. See how fast we send them!

RECORDING CHARTS

DISTRIBUTED BY:
TECHNICAL SALES CORPORATION
189 Van Rensselaer St., Buffalo 10, N. Y.
A SUBSIDIARY OF:
GRAPHIC CONTROLS CORPORATION
Buffalo 10, New York
For More Facts Write No. 197
on Information Card—Page 32

FOB—"filosofy of buying"

IT'S HARD to figure who's getting stupider—advertising readers or advertising copywriters. A recent railroad car ad for the personal loan department of a New York bank showed two young people (one male, one female) standing looking at a large seagoing vessel tied to a pier. The copy suggested a systematic saving plan to accumulate money for a vacation. Then, to make everything clear, the copy included a line in rather large type at the lower left hand corner of the picture: "Ocean liner in port."

And all the while we thought it was a jinrikisha!

• •

N.A.P.A.'S Eighth District program committee came up with an interesting gimmick at the recent district conference in Albany—a combination name tag and program. Your name goes across the top of one side so that it's visible when the card is placed in your breast pocket. The balance of the card—both sides—lists the entire program, so that all you have to do when you want to know where to go next is pull the card out and glance at it. They haven't solved the problem for the ladies, however—so they still use the ordinary pin-type plastic sheathed name cards.

• •

AS WE pointed out in "Buyers Beware: The Racket Boys Are Back" (July 18, 1960 issue) competitive times breed all kinds of schemes designed to bilk the buyer. The following remarks of the director of purchases of a large multi-plant company at an annual meeting of plant P.A.'s reveals another racketeering angle and offers sound advice on how to meet it:

"I am pretty sure you are going to have people coming to you saying that they have permission or a letter from me or a letter from one of the officers of the company telling you it is OK to buy their products. If they say that, be sure to get a good look at the 'letter.' In the first place, no one will be authorized to carry



"Now a word from our president. . . ."

a letter like that unless I first send a copy to you. I will not give anyone a letter to carry around with them as a letter of introduction.

"Also Mr. . . . . .(company president) has assured me that no officer of the company will issue such a letter. If by chance an officer does, you are not to honor it. Send it back, and I am sure it will be taken care of. The president says that he won't do it. If he wants some person to be given some extra courtesy, he will work through me, and I in turn will go through you.

"Just don't be sucked in by any of these claims. The time is getting ripe for this sort of thing."

• •

WHO SAYS purchasing isn't the quickest path to top management status? Jack D. Rice was named director of procurement for Koppers Company, Inc., Pittsburgh, recently. Within a week, another announcement from Koppers revealed his election as vice-president of the company.

• •

JOHN WARD, Chicago's top purchasing man, put it on the line when the New York *Herald Tribune* asked him how he handled identical bids:

"When I get identical bids," said Ward, "I keep giving the business to just one of the firms, instead of spreading it out. That way, you can create a dogfight sometimes. The screams really go out, and the price comes down."

• •

IF YOU'RE having a little trouble getting the Professional Development program going in your local association, Art Pearson, PROD chairman for the Los Angeles Association, may be able to help you with a few ideas. His committee's work sheets on PROD projects (16 different subjects have been assigned to as many committee members) are particularly interesting.

WIRE CLOTH



for

FILTERING

SIZING

STRAINING

TESTING

In all metals, in all weaves . . . woven to the highest accuracy standard in the industry. You just can't buy a better wire cloth than "NEWARK." Hundreds of meshes, weaves and metals to fit *your* specific need. Years of processing experience to help you pick the right wire cloth for *your* application. Write for Bulletin FC or write us about your problem. Fast deliveries, best cloth, lowest cost when you call on NEWARK.

NEWARK for ACCURACY

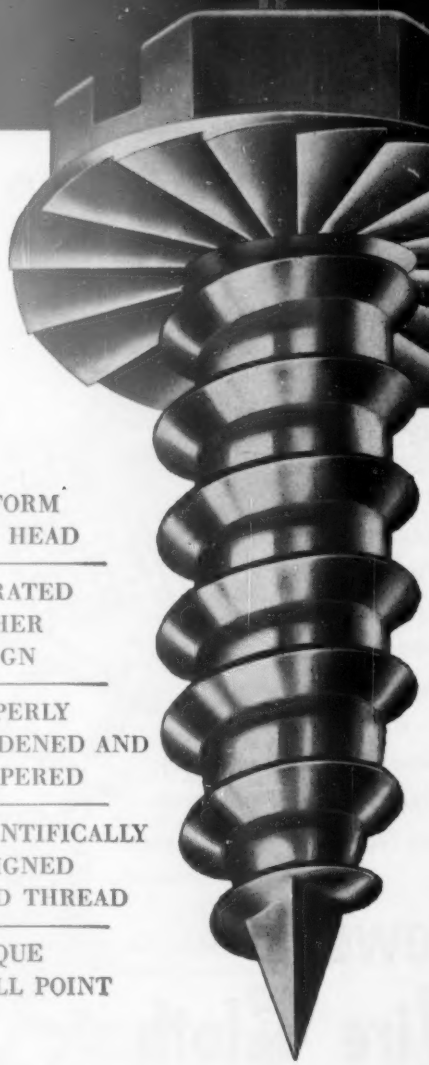
Newark Wire Cloth COMPANY

351 VERONA AVENUE • NEWARK 4, N. J.

For More Facts Write No. 198 on Information Card—Page 32

A real self-drilling screw!





UNIFORM HEX HEAD

SERRATED WASHER DESIGN

PROPERLY HARDENED AND TEMPERED

SCIENTIFICALLY DESIGNED LEAD THREAD

UNIQUE DRILL POINT

Quick as a wink, P-K Tapits drill, tap and fasten light gage sheets! Quicker than a wink, the integral serrated washer takes hold to brake the driving action... minimizes stripping and spinning!

Here is the only expertly designed tapping screw that drills its own hole to start and has its own brake to stop. P-K Tapits, when driven with a power driver, eliminate pre-drilling and punching... save up to 50% on assembly time. Size for size, P-K Tapits hold better than any other sheet metal screw.

DRIVE TAPITS WITH P-K MAGNETIC DRIVER SOCKET!

The same size hex head on the entire range of P-K Tapits from #6 to #10 means you need only one size driver socket. Get the P-K driver socket with a strong Alnico magnet that firmly holds the Tapits. Fits any ¼" driver with adjustable clutch. Socket can be refaced for extended life.

PARKER-KALON® Tapits

Pat. Pending

PARKER-KALON, a division of General American Transportation Corporation, Clifton, New Jersey. Offices and warehouses in Chicago and Los Angeles.

TEST P-K® TAPITS FOR YOURSELF! ASK YOUR DISTRIBUTOR FOR A DEMONSTRATION!

For More Facts Write No. 199 on Information Card—Page 32

For More Facts About Ad on Facing Page Write in No. 200→

FACTS ON **KEYSTONE** POWDER METALLURGY



Powder Metal Parts of STAINLESS and ALLOY STEELS

...too expensive if you don't need 'em —often the cheapest, if you do!

Like Stainless in any other form, your powdered stainless parts will cost more by the pound and do more by the piece. This is also the case with parts of high-strength alloy steel powders—the economies are properly determined solely by the application.

Fortunately, there's no mystery about whether you should or shouldn't use these outstanding materials for your special performance requirements. Our experience as the largest producer of powdered stainless parts is as intensive as our alloy steel and other metals background is broad. We have a wealth of cost and application data that will make crystal-clear your choice and the alternatives to consider.

We suggest that your first step in deciding on stainless, alloy or any other material for your projected part is to *consult Keystone*. We mold and sinter all the commercial metal powders, and we play no favorites!

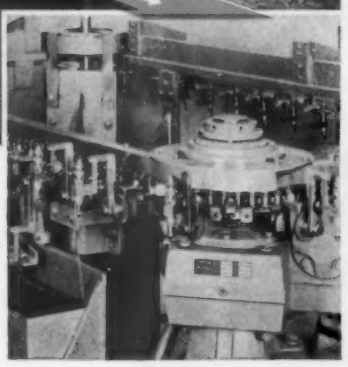


Keystone
CARBON COMPANY
St. Marys, Pa.
POWDERED METAL PARTS DIVISION





Shortest "buy-way" between planning and finished product



. . . standardized parts from stock at local Distributors

When you can get gears, speed reducers, chain and sprockets, bearings and other products of BOSTON Gear quality *off-the-shelf*, at factory prices, from local stocks — why wait for "specials"? Compare costs, and you'll see that "standardization pays" right down the line.

You simplify the design job . . . select components needed from the BOSTON Gear Catalog . . . order all from one local source . . . and get products top-rated for performance and service life.

You save on inventory expense . . . get supplies as needed from Distributors' full stocks. With BOSTON Gear components in products you make and sell, you protect your customers against replacement delays and downtime. Anywhere in industrial U. S. or Canada, there's a BOSTON Gear Distributor nearby to make prompt delivery.

Call your Distributor, and learn how his factory-trained specialists can make "standardization pay" most for you. Boston Gear Works, 74 Hayward Street, Quincy 71, Massachusetts. *Adv. copyright by Boston Gear Works*

CALL YOUR NEARBY BOSTON Gear® DISTRIBUTOR

For nearest Distributor look under "Gears" in the "Yellow Pages"

— STANDARDIZATION PAYS —®

For More Facts Write No. 201 on Information Card—Page 32

In Purchasing . . .

HAVE YOU **investigated linear programming yet?** Don't be embarrassed to say no. It's an advanced purchasing technique that scares a lot of people. "That's too complicated for us" they say; or "we're too small for that sort of thing." Well, they said the same things about value analysis when we were first to report on it 13 years ago—and look how V.A. has caught fire in the the purchasing departments of American industry! So we'll continue to bring you the latest on linear programming, knowing well that progressive purchasing people everywhere will soon be studying and using the technique. Our latest report deals with the application of linear programming to inventory control; the company using it cut inventories 3% without hardly trying. See page 70.

Most purchasing agents have occasion to write contracts that require vendors to meet all their needs for a particular product for a specified time. Known as "requirements" contracts, these arrangements raise many legal problems. What are requirements? What happens if they change within the contract period? What about emergencies? To find out about some of the pitfalls of requirement contracts and how to avoid them, be sure to read the legal article in this issue. See page 86.

This is the season for economic forecasts, and what a season it is, with the pessimists and the optimists firing merrily away at each other. One of the soundest end-of-the-year forecasts we know of is the one prepared by our own Vice President in Charge of Research, Art Dix. His analysis for 1961 appears on page 76.

The practice of industrial racketeering got a severe blow from the expose, "Buyers Beware: The Racket Boys Are Back" we published in mid-July. But don't think those boys give up easily. **There are still plenty of con men around peddling their goods and schemes and it's best to stay on your guard.** A number of fast deals still making the rounds are described in an article on page 80.
(A few reprints of the original article and Paul Farrell's editorial on rackets are still available. Single copies are 25¢; ten or more are 10¢ each. Write to our Editorial Department at 205 E. 42nd St., New York 17, N. Y.)

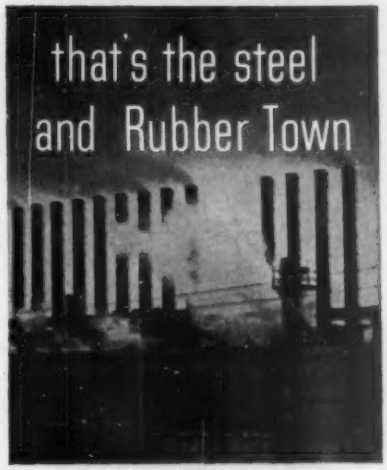


Other features in this issue you'll find interesting and helpful:

There is advice on what to do about overs and unders, page 78; a look at other people's purchasing forms, page 84; descriptions of new products, processes, and materials, starting on page 92.

Ray Richards
Publisher





where
REPUBLIC RUBBER
makes
air, steam, water and suction hose
conveyor, elevator and transmission belting
and other Industrial Rubber Products

REPUBLIC RUBBER
DIVISION LEE RUBBER & TIRE CORP.
YOUNGSTOWN, OHIO
Nylon Finish Sheet Packing Too! Write Dept. D.

For More Facts Write No. 202 on Information Card—Page 32

MORSE DISTRIBUTORS GIVE YOU "ALL THE MOSTS"







Only Morse-Franchised Distributors have
The Combination That Counts in cutting tools—line, quality, same-day delivery, technical help, finest research backup!

Whenever you have a cutting tool need—whatever tool problems you encounter—the *first* man to contact is your local Morse-Franchised Distributor. He's the man with "*all* The Mosts" in the cutting tool field—he serves you fastest with the best!

In fact, right now his local stocks are so extensive you can phone him, order the popular Morse tools you need, get them *in hours*. Try it—call your Morse-Franchised Distributor now!

Morse means more production... smoother, more accurate production...with every type of cutting tool from drills, reamers, taps and dies, to end mills, milling cutters, slitting saws and "specials". So, if you want the best from every cutting tool you buy, mark your order "MORSE". For if you want *Morse Quality*, there's only one way to get it...*specify Morse.*



MORSE

means "THE MOST" *in Cutting Tools*

MORSE TWIST DRILL & MACHINE CO., NEW BEDFORD, MASSACHUSETTS

Warehouses in: NEW YORK • CHICAGO • DETROIT • DALLAS • SAN FRANCISCO

A Division of VAN NORMAN INDUSTRIES, INC. VN

For More Facts Write No. 203 on Information Card—Page 32

CHRISTMAS GIFT PROBLEM--Did you let another year get by without establishing policy on gifts and gratuities? Why not get to work on it now. This magazine has a number of typical policy letters in its files and will gladly lend them to you. This is also a good time to set up your own conflict-of-interest policy. Suggest also, very diplomatically of course, that management might want to use it as a model for a company-wide policy.

MAKE YOUR READING SELECTIVE--How can one man read all the business publications, technical bulletins and other material available to him? The answer is, he can't. One prominent P.A. solves the problem by designating certain publications as "musts"—those he and his buyers feel he must check over personally to stay up on latest developments. The job of screening all other reading matter is assigned to a buyer for a three-month period. It's his duty to screen the material and pass on anything of particular interest to other members of the department.

ECONOMIC INFORMATION--Many big-city banks issue excellent monthly or quarterly letters or bulletins on economic conditions to any businessman asking for them. Two outstanding examples are the letters of the First National City Bank of New York, and the Cleveland Trust Company. There are a number of others of the same high quality. Ask the big banks near you about getting on the mailing list for their authoritative analyses of the business situation.

CLASS IN REQUISITION WRITING--It may not always appear so, but using departments really want to make up correct and complete requisitions for purchasing. But they aren't always sure of just how to do it. The City of Milwaukee a few years ago began regular classes in requisition writing for various departments. The instruction covers how requisitions are processed and how they should be prepared, and why it is of mutual benefit to the requisitioners and to purchasing that each knows exactly what the other wants.

EXPERIENCE COUNTS--You probably have a world of information in your files that could help your sales, advertising, accounting, or other departments. Suppliers' letters, terms of sale, catalogs and bulletins, sales promotion ideas can often be adapted to your company's purposes. Why not pass them on or make them available to others who can use them?

GET SUPPLIERS THINKING--Frank Curran, S. Blickman, Inc., tries to stimulate suppliers' thinking with a sticker that goes on every request for quotation. It carries a suggestion that the supplier take a second look at the item and try to come up with a cost reduction that won't sacrifice quality. The supplier is also asked to quote on both the original requirement and any suggested alternatives.



how do your filing jobs shape up ?

Time and labor, not the file, are the largest part of filing costs. But the file directly affects the time it takes to do the job. The file, being a hand tool, is an extension of the man. If it reduces his skill, the work suffers and costs go up. But if the file matches a worker's skill, he becomes more productive and therefore, costs go down. Nicholson and Black Diamond files are preferred by the majority of industrial purchasers. They're top quality to produce a quality job. They match a worker's skill. There are 6000 different types, shapes and sizes . . . one that's precisely right for your job. And they wear well, thereby reducing your tool replacement costs. Your Nicholson or Black Diamond Distributor* will be glad to help you with your filing problems, help select the right file for your job.

* Industrial Distributors provide the finest goods and services in the least possible time. Our products are sold exclusively through them.

NICHOLSON

NICHOLSON FILE COMPANY, PROVIDENCE 1, RHODE ISLAND

FILES • ROTARY BURS • HACKSAW AND BAND SAW BLADES
GROUND FLAT STOCK • INDUSTRIAL HAMMERS

For More Facts Write No. 204 on Information Card—Page 32



Purchasing And the Election

THE TEMPTATION to address an open letter to a new President is all but irresistible in this age of widespread freedom of speech and high-powered communication. Mr. Kennedy has already been bombarded with advice from all angles by partisans of various causes. Indeed, one advertising executive waited hardly an hour after Vice President Nixon's concession to fire off an urgent "appeal" to Hyannis Port, according to the *New York World-Telegram & Sun.* He asked "for better understanding of marketing and a wider use of its principles to promote economic progress."

Many of those who have spoken up have pointed out to Mr. Kennedy that almost as many people voted against him and his views as voted for them; that he has no mandate from the people to go charging across those new frontiers he spoke so breathlessly of in the past few months.

Purchasing executives, along with most other businessmen, are deeply concerned about the economic policies of the incoming administration. Just before the election, several hundred we surveyed in our Purchasing Opinion Poll (Oct. 24) took a dim view of what they thought would happen under a Kennedy regime: a departure from President Eisenhower's policy of restraint and adoption of more inflationary policies; a more lenient approach to labor and its demands; an unfavorable attitude toward business taxes and depreciation allowances.

Even though the urge to do so is strong, there would be little point to adding to the barrage directed at the President-elect. Even if he had time to listen, Mr. Kennedy hardly needs anyone to explain the election results to him. Nor is he likely to be swayed from his announced plans to be a strong president committed to a liberal Democratic platform before he even sets foot in the White House.

Until we are sure just what course the new Administration is going to take, businessmen would do well to hold their fire. When and if the battle lines are drawn between big government and business, industry should quickly and boldly take its stand. Meanwhile, the advice of Frank M. Porter, president of the American Petroleum Institute, to members of the oil industry applies to all:

"I would suggest we let the new Administration and Congress catch its breath. This, in short, is a call for fair play, and I would like to see the Administration extend the same standards of fairness, the same calm objectivity in addressing the problems of our industry."

Paul V. Farrell

PURCHASING MAGAZINE
DECEMBER 5, 1960

How Western Electric Cuts Costs With Linear Programming

A step-by-step explanation of how Western Electric uses the linear programming approach to reduce purchase costs.

By H. V. Bergstrand,
Purchasing and Traffic Dept.
Western Electric Co.

WE have been using linear programming in the purchasing department of the Western Electric Co. since 1954. Savings have been substantial; on the average, we have been able to reduce purchase costs 3% on every item to which we have applied the linear programming.

The first product we analyzed was steel strand which we use to support telephone cables when they are strung between poles. In our analysis we used the "transportation method" of linear programming. This method is ideally suited to comparing the most economic method of allocating shipments from a number of suppliers to a number of destinations, after considering unit prices from various suppliers, freight, and other variables. The following example illustrates how we applied the technique to rural "C" wire, a commodity we buy in large quantities. To simplify calculations, we will use but nine destinations in our example (although we actually buy the "C" wire for 29 destinations). Names of suppliers and prices are fictitious.

First step in the analysis is to calculate delivered prices from each supplier to each destination. This is shown in Table I. Next step is to circle the lowest delivered price to each destination. From these circled prices, we develop Table 2 which shows the 'ideal" program of buying for each destination from the lowest cost supplier. Table 2 also shows the over-all contract allocation that would then be developed. On this basis, Allen would get 50% of the business, Bruce 42%, and Carter 8%. Doner and Egger would get no business at all.

This "ideal" program would then be reveiwed. It would not always be accepted because:

(1) Suppliers' capacities may be insufficient to meet their allocations.

(2) Quality and service factors may dictate a higher proportion to a supplier than the

TABLE 1 — "C" RURAL WIRE — COMPARISON OF DELIVERED COSTS PER REEL

Destination	Rqts. (In Reels)	ALLEN (Mass.)	BRUCE (N.J.)	CARTER (Calif.)	DONER (R.I.)	EGGER (Ill.)
Boston	620	$299.50	$304.85	$361.25	$303.70	$324.45
Syracuse	310	303.35	305.60	361.25	307.65	322.30
Washington	1,105	307.10	305.90	361.30	308.40	323.00
Atlanta	770	310.80	310.40	358.00	311.60	325.70
Nashville	595	310.40	311.10	356.35	314.80	323.05
St. Louis	485	308.95	309.55	347.00	313.30	319.90
Denver	250	321.15	321.85	338.80	325.25	326.85
San Francisco	250	333.25	334.80	323.60	337.35	346.80
Portland	100	333.25	333.12	330.90	337.35	346.80
Total Reqts.	4,485					
F.O.B. Price		$296.85	$298.20	$321.80	$300.95	$313.50

TABLE 2—"C" RURAL WIRE—IDEAL PROGRAM

Destination	Rqts. (In Reels)	ALLEN	BRUCE	CARTER
Boston	620	620		
Syracuse	310	310		
Washington	1,105		1,105	
Atlanta	770		770	
Nashville	595	595		
St. Louis	485	485		
Denver	250	250		
San Francisco	250			250
Portland	100			100
Total	4,485	2,260	1,875	350
% of Total		50.4	41.8	7.8

Contract Allocation

	No. of Reels	% of Total
Allen	1,795	40.0
Bruce	1,120	25.0
Carter	448	10.0
Doner	675	15.0
Egger	447	10.0
Total	4,485	100.0

"ideal" allocation.

(3) Allocations to a new and unproven supplier may have to be limited until experience is gained on his quality and service.

(4) Additional suppliers may be selected to protect against interruptions in production.

(5) Servicing contracts with as many suppliers as reflected in the "ideal" may be impractical.

(6) It may be desirable to avoid giving so much business to a supplier that he becomes dependent on Western Electric for existence.

The buyer's contract allocations in this case are also shown in Table 2. Allen and Bruce were limited to a lower percentage of business than under the "ideal" while Doner and Egger were awarded 15% and 10% respectively.

The 'ideal" program is a starting point toward the first shipping pattern in the linear program. Tables 3 and 4 illustrate how we can quickly switch from the "ideal" program to an initial pattern

TABLE 3 — 1ST MOVEMENT FROM THE "IDEAL"

	Rqts. (In Reels)	"Ideal" Allen	Delivered Costs ($ Per Reel) Allen	2nd Lowest	Company	Difference	Rank
Boston	620	620	$299.50	$303.70	Doner	$4.20	4
Syracuse	310	310	303.35	305.60	Bruce	2.25	3
Washington	1105						
Atlanta	770						
Nashville	595	595	310.40	311.10	Bruce	.70	2
St. Louis	485	485	308.95	309.55	Bruce	.60	1
Denver	250	250	321.15	321.85	Bruce	.70	2
San Francisco	250						
Portland	100						
Total	4485	2260					
Contract Allocation	4485	1795					

TABLE 4 — 2ND MOVEMENT FROM THE "IDEAL"

	Rqts. (In Reels)	Allen	Bruce	Delivered Costs ($ Per Reel) Bruce	Next Lowest*	Company	Difference	Rank
Boston	620	620						
Syracuse	310	310						
Washington	1105		1105	$305.90	$308.40	Doner	$2.50	2
Atlanta	770		770	310.40	311.60	Doner	1.20	1
Nashville	595	595						
St. Louis	485	20	465	309.55	313.30	Doner	3.75	3
Denver	250	250						
San Francisco	250							
Portland	100							
Total	4485	1795	2340					
Contract Allocation	4485	1795	1120					

*Excluding Allen

that will be relatively close to the final program. Allen's "ideal" allocation is 465 reels over its contract allocation.

To determine where these reels should go, we calculate the difference in cost between Allen and the next low supplier for each of Allen's scheduled shipments. Bruce will ship to St. Louis for only $.60/reel more than Allen and no other supplier's delivered costs are that close on any of Allen's other shipments. We, therefore, assign these 465 reels to Bruce. Table 4 shows the allocation for Allen as altered, the "ideal" allocation for Bruce and the 465 reels it will ship in place of Allen. The "ideal" already indicates more reels for Bruce than are allocated so we must now move 1220 reels from Bruce to the next lowest supplier. As a result we move Atlanta's requirements from Bruce to Doner and then move 450 of Washington's requirement to Doner. Subsequent changes may affect some of the moves we have already made. In this instance, 545 of Atlanta's total requirement of 770 reels are later shifted from Doner to Egger.

By continuing this procedure, we can arrive at an initial ordering and shipping pattern which covers the exact requirements of all destinations and meets the allocations set by the buyer. Not much time is involved and each step we take brings us closer to the final program.

The resultant initial shipping pattern, shown in Table 5, is then used to develop our first matrix table which is devised to solve a number of linear equations simultaneously. Each time we work through the matrix we refer to the step as an iteration The iterations lead us progressively to the best solution.

TABLE 5—ITERATION 1—Initial Shipping Pattern

	Rqts. (in Reels)	Allen	Bruce	Doner	Egger	Carter
Boston	620	620				
Syracuse	310	310				
Washington	1,105		655	450		
Atlanta	770			225	448	97
Nashville	595	595				
St. Louis	485	20	465			
Denver	250	250				
San Francisco	250					250
Portland	100					100
Total	4,485	1,795	1,120	675	448	447

TABLE 6 — ITERATION 1 — FIRST MATRIX TABLE

	Allen	Bruce	Doner	Egger	Carter	Value
Boston	299.50	300.10	302.60	316.70	349.00	— .50
Syracuse	303.35	303.95	306.45	320.55	352.85	3.35
Washington	305.30	305.90	308.40	322.50	354.80	5.30
Atlanta	308.50	309.10	311.60	325.70	358.00	8.50
Nashville	310.40	311.00	313.50	4.55 327.60	8.55 359.90	10.40
St. Louis	308.95	309.55	312.05	6.15 326.15	11.45 358.45	8.95
Denver	321.15	321.75	324.25	11.50 338.35	31.85 370.65	21.15
San Francisco	274.10	274.70	277.20	291.30	323.60	—25.90
Portland	281.40	282.00	284.50	298.60	330.90	—18.60
Column Value	300.00	300.60	303.10	317.20	349.50	

The matrix in Table 6 is developed in the following manner:

We first post the actual delivered unit costs for the shipments indicated in the initial shipping pattern. These are shown in color, and at this point are the only numbers in the table to considered.

At the extreme right of the table is a column headed "Row Value" and at the bottom a row we call "Column Value". We require a column value for each supplier and a row value for each destination point. To establish them we assign an arbitrary number under the Allen column which becomes our first column value and serves as a basic reference point. This could be any number, but for convenience we have selected $300, a nice round number which is close to our delivered costs.

The value of each shipment indicated in the matrix table must be equal to the column value plus the row value. Therefore, to establish the first row value, we subtract the column value of $300 from the cost of Allen's shipment to Boston which gives us a minus $.50. Thus, this row value plus the column value of $300 equals $299.50, the cost of shipping from Allen to Boston. Likewise, by substracting the column value from Allen's delivered cost to Syracuse, the second row value equals $3.35. In the same way, we establish the row values for Nashville at $10.40, St. Louis at $8.95 and Denver at $21.15. Since we have a row value for St. Louis and Bruce has a shipment to that house, we know that the column value for Bruce must equal the cost of that shipment less the row value and is, therefore, $300.60. We can then establish the row value for Washington at $5.30.

In turn the $5.30 subtracted from the cost of Doner's shipment to Washington will give us $303.10 as a column value for Doner. Atlanta's row value is established through Doner's shipment at that point and is used in turn to establish column

(Please turn to page 182)

TABLE 7—ITERATION 1—Changes to Initial Shipping Pattern

	Rqts. (in Reels)	Allen	Bruce	Doner	Egger	Carter
Boston	620	*620				
Syracuse	310	*310				
Washington	1,105		655+x	450−x		
Atlanta	770			225+x	*448	97−x
Nashville	595	*595				
St. Louis	485	20+x	465−x			
Denver	250	250−x				+x
San Francisco	250					*250
Portland	100					*100
Total	4,485	1,795	1,120	675	448	447

Control Inventories the Easy Way

By concentrating its efforts on the 70 most important materials in its 600-item raw material inventory, Dewey and Almy purchasing has been able to set up a system which will save the company more than $100,000 this year.

By Leonard Sloane,
News Editor

EVERY October, purchasing at the Dewey and Almy Chemical Division of W. R. Grace & Co. sets up a cost reduction goal for the following year. At the same time it works out specific programs to meet the goal.

Take the 1960 cost reduction program planned over a year ago by Purchasing Agent Austin Secor and his 15-man staff in Cambridge, Mass. Perhaps the most important part of the program is the inventory reduction drive which is focused on raw material inventories. About 600 materials are on the company's active inventory list, including synthetic rubber, hexane, vinyl acetate, and various solvents. After close analysis, Secor found that 70 of the 600 items accounted for 90% of total inventory dollar volume.

First step was to divide the materials into "A" and "B" categories. In the "A" category went the 70 high-cost items; the remaining 530 materials were placed in the "B" category.

Simple maximum and minimum quantities were set up for the "B" inventories by purchasing and the planning and scheduling department. They are listed on stock cards and checked by the inventory clerks when shipments arrive. When the minimum is reached, the clerks issue a requisition and a buyer sends out an order. Aside from occasional minor problems, little time or attention is given to these items.

The "A" inventories, however, are a different story. Every day, either Secor or Assistant P.A. John Anderson study the inventory figures on these 70 items. Current market conditions, transportation developments, sales reports, and cash flow are all taken into account in determining when and how much to order.

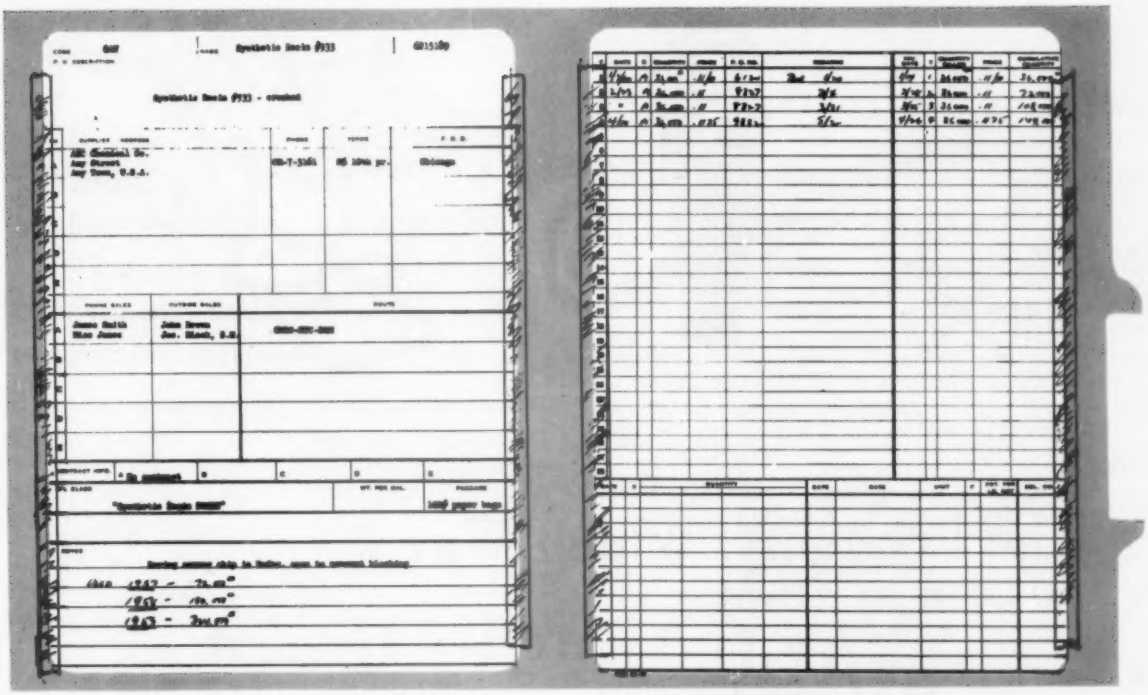
Frequent meetings are held between Secor and production scheduling engineers to determine proper inventory levels on these key items. By constant review, they strive to balance two goals: keeping inventories down while taking advantage of price breaks as they occur. At the same time Secor makes certain that there's no chance of a stockout on long lead time items.



The recently-remodeled purchasing department office at Dewey and Almy features glass dividers, L-shaped desks, and movable partitions.

Vendor Gets Head Start

For instance, one of the "A" items is a resin that Dewey and Almy buys from a supplier in Georgia. Secor figures a 12-day lead time for the material—seven days for transportation, four days to handle the paperwork on both ends, and one day in the purchasing department to clear the requisition.



Purchase record cards for important raw materials are attached to file folders. All pertinent data are included and are available for easy reference during the daily review of these items by purchasing.

When Secor sees a sales report calling for a material using this resin in especially large quantities he gets right to work ordering the resin by telephone or wire. A confirming purchase order is also sent out, but in the meantime the supplier has already started to work on the order, knowing that Dewey and Almy must have the resin by a particular date.

Purchase record cards for all "A" inventory items are kept in folders in the purchasing files (see cut). The card attached to the left hand side of the folder lists the name of the material, the Dewey and Almy identification code and a brief description of the material. It also has information about authorized vendors—including names, addresses, telephone numbers, terms, F.O.B. data, and the names of the vendors' inside and outside sales contacts. Shipping dates and special notes are also listed on the purchasing record card.

Attached to the right side of the file folder is a card on which a running record of purchases is kept. Dates of each order, quantities, prices, invoice dates, and cumulative amounts are also shown. As a result, purchasing can get all the information it wants on any "A" item merely by glancing at the purchase record file.

No P.O.'s. on Small Orders

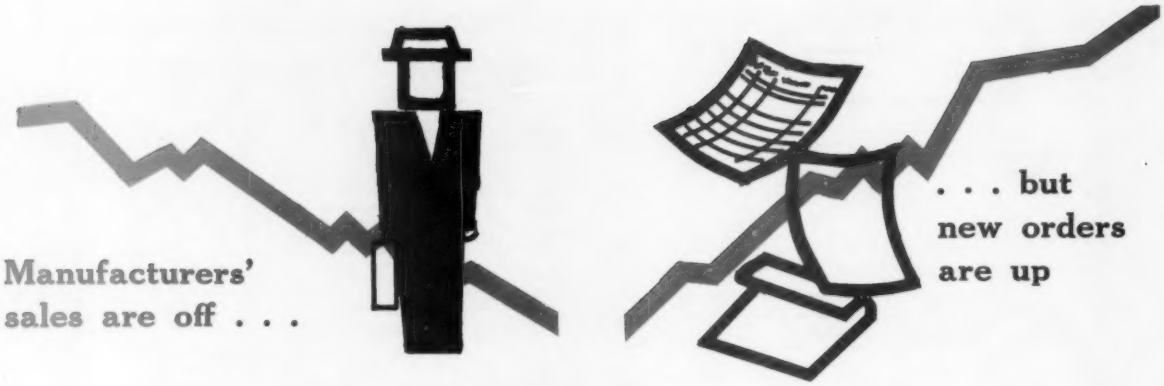
Among the other ideas that were put into effect as part of Dewey and Almy's 1960 cost reduction program was the elimination of the purchase order for local supply items. Around five hundred of these orders had been issued each year—sometimes for items which cost less than the amount required to process the paperwork.

Secor decided local orders could be made exclusively by phone and that there was no need for either a purchase order or a confirmation copy. Now, when requisitions for small MRO items are received in purchasing, a buyer telephones the order to one of the local approved vendors and gives him the requisition number. A copy of the requisition is then sent to receiving.

As the material arrives, receiving checks off the shipment by requisition number—instead of the purchase order number. The supplier also uses the requisition number to identify the order on his invoice.

Is there ever any confusion over the lack of a purchase order? No, says Secor. "First of all, we only use this system for low-cost items which are simple and rarely worth making a fuss over. Secondly, we've been dealing with our local vendors for many years and have worked out a fine relationship with them. Everything works smoothly and we've cut our costs considerably on these items."

With the "A" and "B" inventory system as the core of the Dewey and Almy cost reduction program, large savings have already been made this year. In 1960, the expected purchasing savings will be over $100,000—somewhat more than was estimated when the goal was established in October 1959. This is enough to pay for the entire operating budget of the department—proof positive of the value of the program. ► END



The Economy: Which Way Are We Headed?

By Arthur H. Dix,
Vice President—Research, Conover-Mast Publications, Inc.

YOU CAN get just about any kind of opinion you want as to the present state of business—and what's ahead.

The professionals themselves are confused and argue among themselves as to what the signs mean. The business gauges have never been so closely watched.

Daddy of all the economic reports is the "Survey of Current Business," issued every month by the U. S. Department of Commerce. It takes just about every business measure of any consequence. Let's see what is shown by the October issue, just released:

Gross National Product

GNP was $505 billion as of the end of the second quarter (June) an all-time record. Estimates for end of 3rd quarter are $503 billion. So slippage in the big economic gauge, GNP, is $2 billion—a flicker of less than ½ of 1%. But does this portend a more serious drop in the 4th quarter? No one knows. The great unknown is the state of confidence. If a lot of people think things are going to pot and hold off buying cars, coats, advertising space, houses and pop-up toasters, things will go to pot.

So the pros are keeping their eyes glued in particular on the statistics that measure confidence.

Investment in New Plant and Equipment Continues High

When businessmen lose confidence they stop expanding. So what's the outlook for "New Plant and Equipment Expenditures" (as the government calls it) for the 4th quarter?

New Plant and Equipment Expenditures
Annual Rate—Seasonally Adjusted

1960	4th quarter	(estimate)	$36.90 billion
"	3rd "	(estimate)	36.90 "
"	2nd "		36.30 "
"	1st "		35.15 "
1959	4th quarter		$33.60 billion
"	3rd "		33.35 "

So far the statistics show no pulling in of horns with regard to expansion. But *The Wall Street Journal* says a survey it has just made indicates a reduction in capital expenditures in '61.

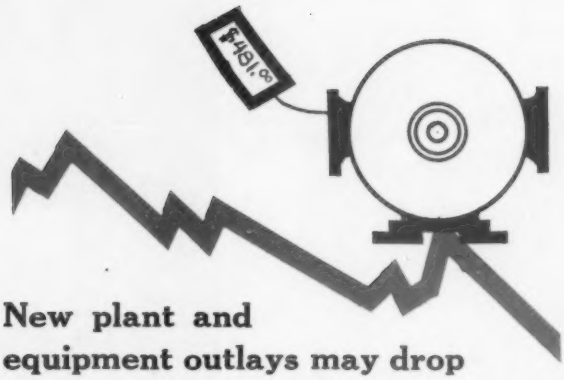
Industrial Production Is Off About 4% From Its 1960 High

Another barometer watched closely is industrial production, as measured by the Federal Reserve Board. Estimate for September is 107. This means 7% higher than the base year, 1957. 107 is 4 points below the high for 1960, registered in January:

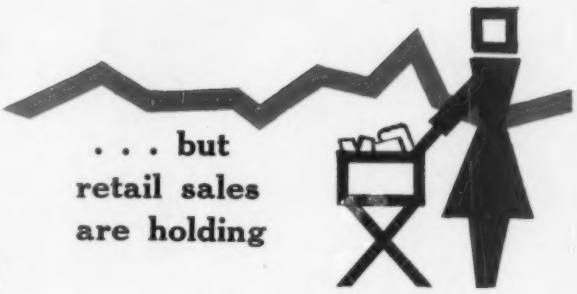
Industrial Production—Federal Reserve Index
Seasonally Adjusted

September 1960	107 (estimate)
August	108
July	110
June	109
May	110
April	109
March	109
February	110
January	111

The index for September 1959 was 103, but it isn't fair to compare that with September '60, as the steel strike was still going a year ago. You could say, if you wished, that the decline from



New plant and equipment outlays may drop



. . . but retail sales are holding

110 in July '60 to 107 in September marks the beginning of a slide. But a 3-point fall-off is hardly alarming.

Manufacturers' Sales Off 5% From Year's High

The September manufacturers' sales were 5% below the highest month of the year—February:

(mfrs. sales, seas. adj.)	
September 1960	$29.90 billion
August 1960	30.14 "
July	30.44 "
June	30.78 "
May	30.99 "
April	31.03 "
March	30.84 "
February	31.58 "
January	31.11 "
August 1959	29.27 "

On the other hand, manufacturers' new orders are up over the preceding two months and are within a hair's breadth of the top month of the year:

Manufacturers New Orders

Seasonally Adjusted	
September 1960	$30.40 billion
August	30.00 "
July	29.19 "
*February	30.59 "
August 1959	29.02 "

*Top month of year

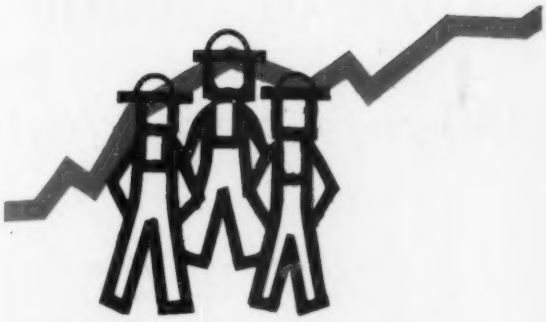
There has, however, been a pretty steady decline in manufacturers' unfilled orders—from the recent peak of $51.51 billion in November 1959 down to $47.32 billion in August '60. A big chunk of the fall-off is in the steel industry, which had $5.32 billions in unfilled orders in November '59 and only $2.50 billion or less than half as much, in August '60.

In contrast, unfilled orders for machinery are above a year ago.

Unfilled Orders for Machinery

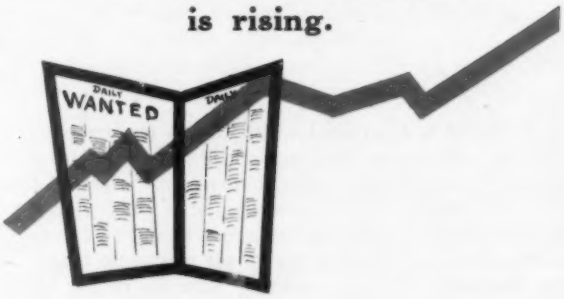
Unadjusted	
August 1960	$18.21 billion
*July	18.26 "
August 1959	17.83 "

*Highest for year



Employment is near peak levels

. . . but unemployment is rising.



Retail Sales Continue At the $18 Billion Monthly Level

Retail sales haven't been breaking any records lately. On the other hand there hasn't been any marked fall-off:

September 1960	$18.02 billion
August	18.19 "
*April	18.91 "
August 1959	18.11 "

*Top month of '60

Population Up 2.1%—Buying Power Of Dollar Down 1.4%—In Last 12 Months

In matching up a statistic of today with one of

(*Please turn to page* 180)



How to Handle Overs and Unders

There should be no problem when a supplier ships more or less of an item than is specified on your order. If you are familiar with commercial law and trade practice you will know whether to accept or reject an inexact shipment.

By F. M. Seitz,
Military Electronics Division, Daystrom, Inc.
Materials Manager,

THERE'S a good deal of confusion among purchasing, receiving, and accounting people about undershipments and overshipments of purchased materials. Some buyers are unsure of their rights in accepting or rejecting incorrect amounts. Some accounting departments try to set arbitrary limits on discrepancies—e.g., nothing over ½ of 1% of the amount ordered, regardless of the item.

Many companies have no rules at all. Buyers just play it by ear and different buyers in the same company may handle identical shipments in completely different ways. For example, an eager-beaver may bounce back an overshipment of a single piece and, although the supplier may be annoyed, he is likely to just grin and bear it simply to preserve the buyer's good will. Another buyer may O. K. overshipments of 10-15%. He dosen't really care what the company's inventory jumps to, as long as he gets no complaints from his supervisor or from the stores department.

Buyers also treat different suppliers in different ways. They may be tough on over and under shipments from chronic offenders and lenient on suppliers who usually ship the exact order quantity.

Most of this confusion can be avoided. Certain general principles of commercial law and trade practice spell out responsibilities of buyers and sellers in respect to overs and unders.

In general, the quantities specified on purchase orders are binding. Unless the provisions of the contract are complied with, the buyer is not obligated to accept or pay for something he did not order.

On most items, the question will rarely come up. When you order ten gross of standard screws, or two dozen paint brushes, or three typewriters, you should get exactly that. Even on non-standard items—one special drill jig, 75 radar antennas, 12 special transformers, etc.—delivery should be right on the nose.

Trade Practices Vary

The buyer does not have to accept over or under shipments of these commodities. He can return the excess for credit at the seller's expense; or in the case of undershipment, can insist on delivery of the full amount ordered.

This is not always the case, however. Trade practice permits over and under shipments on a wide variety of commodities. Unless special agree-



ments are negotiated and specifically stipulated in the purchase order, the buyer must accept deviations within specified tolerances. These range from plus or minus 3% for larger quantities of sand castings to as much as plus or minus 20% for small quantities of rivets.

These are some typical variations permitted by trade practice:

Aluminum sheet and plate, wire, rod and bar, structurals, extruded shapes, tubular products (from the mill)	less than 500 lbs 500-9,999 lbs 10,000 lbs or over	±10% ± 5% ± 3%
Aluminum sand, permanent mold, and plaster process castings	less than 500 pcs 500-9,999 pcs 10,000 pcs or more	±10% ± 5% ± 3%
Aluminum rivets	10-24 lbs 25-49 lbs 50 lbs and over	±25% ±15% ±10%
Zinc or aluminum die castings	any quantity	±10%
Special screws and screw machine parts	any quantity	±10%
Ductile iron castings	" "	"
Special springs, wire forms	" "	"
Special stampings	" "	"
Molded plastic parts	" "	"

Many suppliers print special terms and conditions on the back of their own acknowledgment forms. A few examples:

"On all non-stock standard items and items built to customer's specifications we reserve the right, owing to manufacturing fluctuations ,to make a 3% plus or minus variation, but not less than five items of each specification in the shipment of the above order." (Electrical machinery manufacturer.)

"We reserve the right to ship the buyer any quantity of special bearings up to 10% in excess of, or less than, the exact quantity covered by the buyer's order. Such overrun or underrun will be considered as complete performance of the buyer's order." (Bearings manufacturer.)

"Unless otherwise stipulated, the customer shall accept an overrun of 10% above quantities specified on order. However, the foundry is to make an effort at all times to furnish as near the exact quantity specified as operating conditions will permit." (Terms and Conditions of Sale, Gray Iron Foundry Industry.)

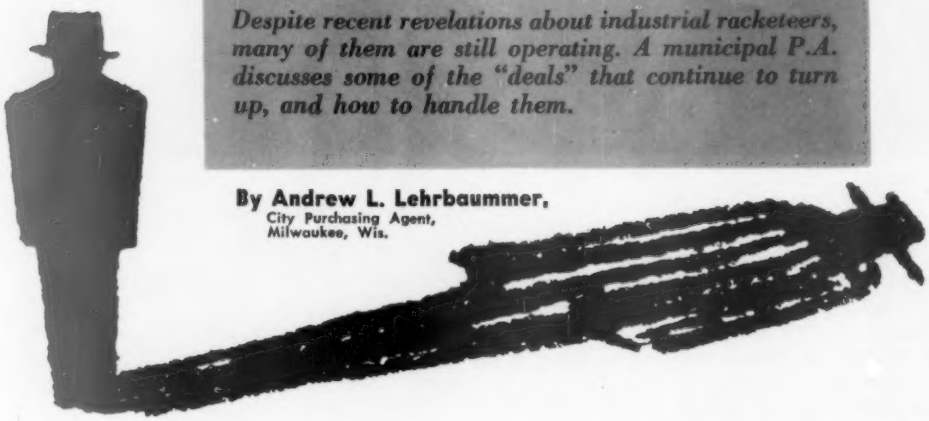
"P.O. Should Be Specific"

In any case, if you have any doubts about the seller's practice or intent, and if exact quantities are important, everything should be spelled out in the request for quotation, in the seller's bid, and in the purchase order. The purchase order should state that the quantity called for is the precise amount required, that undershipments will not be tolerated, and the overshipments will be returned for credit at the seller's expense.

It is important for the buyer to know and understand the trade practices that apply to his commodities. This will enable him to assist requisitioners in planning order quantities, and thereby maintain better inventory control and eliminate shortages. It should be both purchasing's and production's objective, of course, to finish a given job on time with zero surplus material on hand.

► END

Gullible Buyers Still Being Cheated



Despite recent revelations about industrial racketeers, many of them are still operating. A municipal P.A. discusses some of the "deals" that continue to turn up, and how to handle them.

By Andrew L. Lehrbaummer,
City Purchasing Agent,
Milwaukee, Wis.

A FEW ISSUES ago (July 18, 1960) PURCHASING Magazine told us about a number of rackets being pulled on industrial purchasing agents. There are a number of other shady deals being offered to buyers in both industry and government. Some of the experiences we have had in Milwaukee should serve as a warning.

The Watered Paint Case. A California company annually sends out a stereotyped letter to nearly every city official. Explaining that it finds itself in a "distressed stock" situation, the company says it has about 200 gallons of genuine exterior white paint in a nearby warehouse. The paint is described as of top quality, and is offered at the very low price of $2.75 a gallon.

Both the Federal Trade Commission and the Better Business Bureau have lowered the boom on this company—yet it continues to offer its wares. The BBB tested the paint and found that it was 17% water, the percentage of pigment and solids was low, and the hiding quality was low. As early as 1942 the FTC ordered the company to cease misrepresentations in its sales efforts. In 1954, the company was fined for continuing improper practices. Yet I'm sure that, just like the spring zephyrs, the outfit will be back in 1961 peddling its shoddy product.

The Lifetime Battery Case. A few years ago, we were encouraged by several aldermen to purchase automotive batteries with a lifetime guarantee. These cost approximately three times more than the batteries we were buying on a blanket yearly contract. We decided to look into the background of the firms extending this "lifetime guarantee." This, after all, is a long time and all-inclusive. A Dun and Bradstreet report revealed that one of the firms had been in business approximately six months. The other had a record of venturing in all sorts of endeavors over the past several years, with an average business stand in each of about six months. Such stability for lifetime guarantees!

All of you, I am sure, have been approached on additives to prolong the life of automotive batteries. The most conspicuous of these, of course, is the controversial ADX2. There are all sorts of additives being peddled for gasoline, fuel oil, motor oil and occasionally coal. It is good practice not to use of any of these until they are analyzed and approved by your testing laboratory or some technician in your organi-

This article is adapted from Mr. Lehrbaummer's recent address at the National Institute of Governmental Purchasing Conference in Washington.

zation. If these services are not available, don't you be a guinea pig. Try to get references from other buying agencies. You will find N.I.G.P. and fellow public buyers helpful and cooperative. There have been some bitter experiences in the use of additives. It shouldn't happen to you.

"Satisfied Customer" References. We are all familiar with the firm that insists on having your agency place a trial or experimental order. If you don't of course, you are not progressive or keeping pace with developments. A short while later that company's entire sales force is armed with photographic copies of your order, mounted in a plastic jacket. The information to other prospective customers is that you are a regular user of their products. I am never impressed when a long list of "satisfied users" is pulled out by a salesman. Who knows how they were developed? Some may have stemmed from golf courses, where no one was responsible. Many times these lists of "satisfied users" are just lists of companies that actually have never used the product in which you are interested.

Tie-In Gift Deals. Probably most P.A.'s know something about the tie-in gift deals that are particularly prevalent in the maintenance field. An employee in one of our hospitals was asked to sign an order for a 55 gallon drum of liquid cleaning compound from a Tennessee company. Sign up, he was told, and receive a three-way portable radio or a gift of equal value. Fortunately, the employee referred the matter to the purchasing department.

We registered a complaint with the Federal Trade Commission's Bureau of Anti-Deceptive Practices. We felt that the case involved a bribe offered to a public employee. The commission referred the matter to the Department of Justice, which said that the Federal bribery statutes relate to an offer, acceptance or solicitation of a bribe involving a federal officer or employee only, and the matter was not further pursued. Regardless of the law involved, however, this is a rotten practice as far as professional purchasing people are concerned and it's up to all of us to fight it.

How F.T.C. Defines Fraud

Misrepresentation in interstate commerce is punishable under the Federal Trade Commission Act. Among the offenses included in the act:

(1) Statements on labels, in advertisements, orally or by other means of communication, which directly misrepresent products or services as to content, quality, value and the like, or which contain false implications through claims as to origin, sales, approval, etc.

(2) Failure to reveal pertinent or vital facts concerning a product which it is the duty of the vendor to reveal, e.g., whether it is second hand or of second grade quality, or fraudulently concealing facts which would constitute material inducements.

Dirty Work on Scrap and Surplus. There are a number of tricks that have been tried on us by unscrupulous scrap dealers. Here are a few:

Switching un-numbered trucks. Dealers weigh in an empty heavy truck and then switch to a lighter truck to make the haul. They are weighed out after the load is on, so get free an amount of scrap equal to the difference in weight of the trucks. To prevent this switching, we note the state registry number and also the truck license plates. In some instances, we have put an identifying chalk mark on the bottom of the truck so that we can tell whether the same truck is being used. When there are consecutive loads, we insist that the empty truck be weighed after each load. Even taking on 40 or 50 gallons of gasoline can be manipulated to their advantage.

Carrying hidden extra weights between the truck chassis and the body at the time of the empty weigh-in. The weights are removed before the truck is loaded and the compensatory weight in scrap is received by the dealer without payment. In some cases big heavy drivers have weighed in, only to be replaced by puny fellows when the load is weighed out. We insist that drivers vacate the truck at both weighings, and we look for any heavy plates or steel bars. Occasionally at the weigh-in, the truck contains apparent tools of the trade, such as sledge hammers, wheel barrows, steel side and bottom plates, empty drums, etc. We insist on the removal of such things at all weighings.

Manipulation of scales at the yards of scrap dealers. We issue a list of city bonded scales to successful scrap dealers and insist upon weight tickets from these locations. If no one accompanies the load of scrap, when the scale is located between the removal point and the scrap dealer's yard, there is a good chance that you are going to be taken.

Switching different types and grades of scrap metals in adjoining bins. Example: you may have three tons of sheet iron which you have sold for $6.00 per net ton. In the other bin you have approximately six tons of prepared scrap cast iron, which you have sold for $35.00 a ton. You many wind up, if the loading is not closely watched, with receipts for five tons of sheet iron and four tons of cast iron. You very soon come to the correct conclusion that some cast iron was at the bottom when the scrap sheet iron was loaded. ► END

Don't Fight EDP —Use It



Purchasing will be judged by modern management on how well it is organized and its success in carrying out its assigned mission. Electronic data processing systems can provide the information management needs to make a judgment. It's to the P.A.'s own interest to understand and use EDP as much as he can.

By B. W. Phillips

HANGING "Purchasing for Profit" shingles around an office or boasting about how much was saved on certain deals is not the way to impress management. There are other ways purchasing can enhance its position in a company. If purchasing doesn't take steps now to establish itself strongly in the eyes of management, it may be totally absorbed in the growing material management concept, particularly in those companies using electronic data processing (EDP.)

The success of today's purchasing manager will be based on two basic principles of control:

(1) The establishment of an organization best designed to carry out a given mission;

(2) The maintenance of this organization at peak efficiency.

How well the purchasing agent does these things will depend mainly on his interest in and ability to apply current methods of automated administration. He must know what kind of information is available to him through EDP and how to present it to management. Too many purchasing agents fear and resent electronic data processing. They fail to realize what a potent tool for recognition it can be.

Put yourself in the position of the company officer to whom purchasing reports. What information would you expect from the department? What growth programs would you expect the department to be sponsoring? A little initiative and imagination in the use of material available to you will help you impress management with the importance of your function and the performance of your organization.

What Management Wants

Reports like these must not be routinely completed. If they're frequently supplemented with additional data their prominence and value is increased. An occasional attachment describing a cost reduction project would interest any top executive. To be current and of immediate service the information in this type of report would have to come from data processing machines.

It is unfortunate that some aura of the unknown has surrounded the expanded use of data processing equipment. Reference to these machines as computers along with some space age terminology has caused many administrators to avoid investigating their use. Purchasing managers should look on these machines as a means of *storing* huge amounts of information and returning it *very rapidly* in any reasonable form. For instance: If information from each purchase order for example, is fed into storage in an EDP system, we can and get from the equipment such information as:

(1) Total dollar expenditures—MRO, Capital, etc.

(2) Total dollar expenditures—by plant

(3) Total dollar expenditures—by category

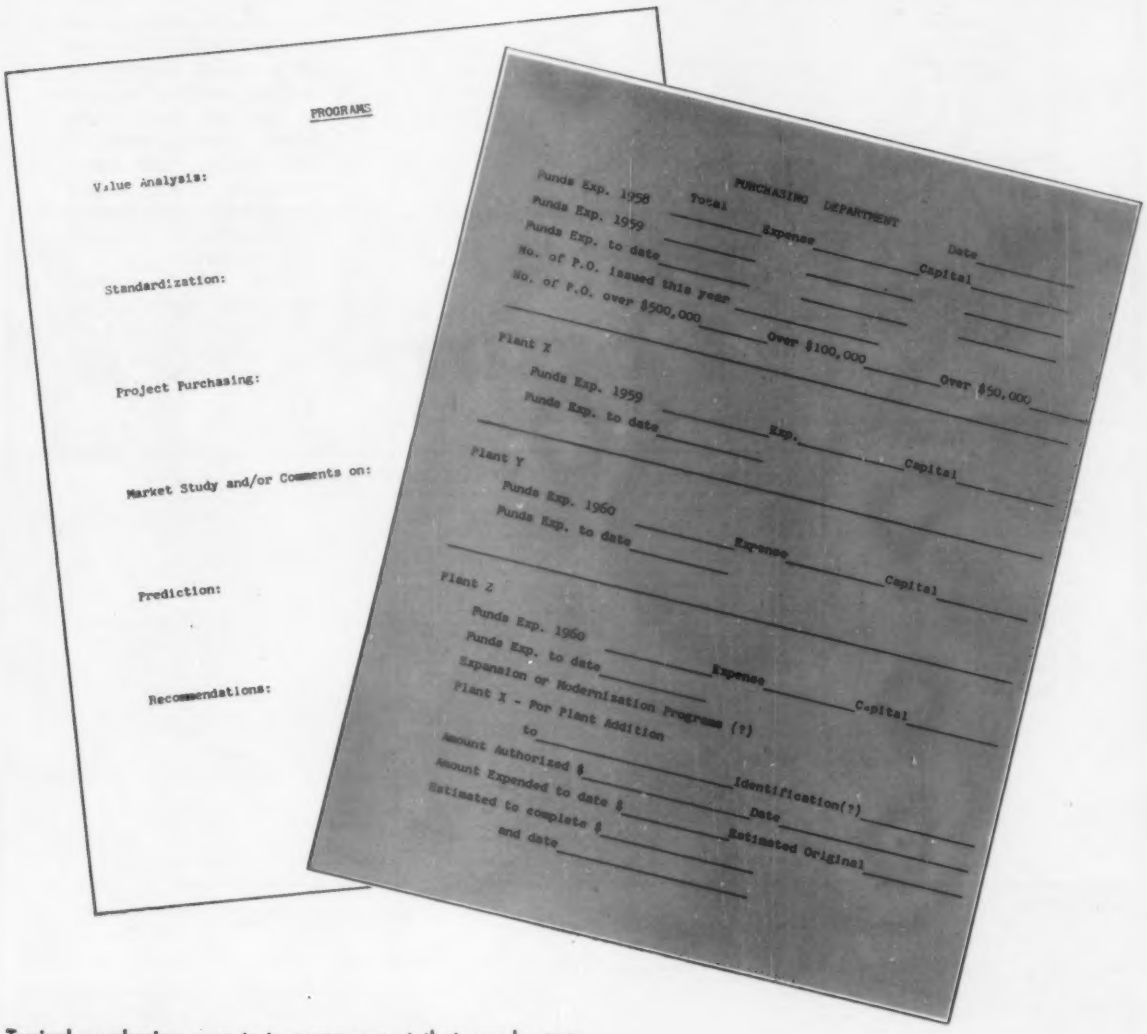
(4) Total dollar expenditures—by category by plant

(5) Purchase Order issued per month—per year, etc.

(6) Purchase Order issued per category—per month—per plant

(7) Total purchases from indi-

Mr. Phillips has had extensive purchasing experience in the Navy and is currently in the purchasing department of the Reynolds Metals Co. in Richmond, Va.



Typical purchasing reports to management that can be prepared promptly and regularly from data processing output.

vidual supplier per month or per year

(8) Total purchases from each supplier per plant

(9) Rate of dollar expenditure vs estimated

(10) Requisitions received and processed

(11) Requisition on hand—and dollar totals

(12) Expenditures by departments—daily, monthly, etc.

(13) Total P.O.s processed—by plant—department and category

(14) Project Planning—Budgets, price and delivery, history

(15) Project Control—Expenditure—scheduling

(16) Management reports—detailed or summary

These are only examples of the information that may be extracted. A most important feature in such a system is the very rapid availability of this information—daily summaries of key action can be prepared for the department head.

In a sophisticated buying process this information suggests and determines decisions. For example, what commodities should be subjected to centralized purchasing techniques, or, from the industrial engineering standpoint, what items should be studied for "make or buy" consideration?

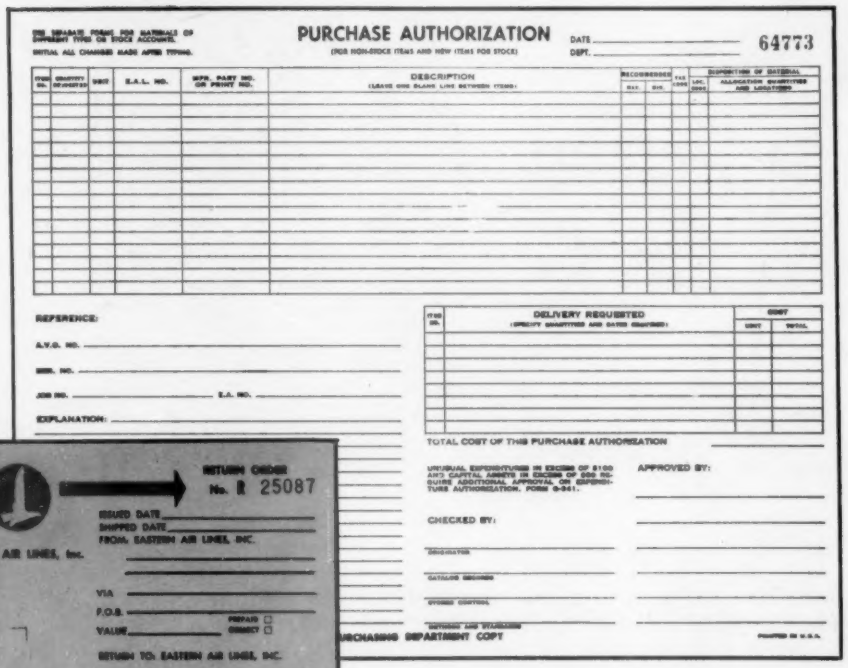
Each company can tailor its output to suit its own requirements, for there are infinite refinements to the information that can be extracted from this mechanical storehouse. Some interesting mathematical investigations can be made on the aggregate data. And as we gain more experience in the use of this data reduction we will be able to work out ratios that will be indicative of the various phases of efficient purchasing performance. These ratios may be worked out empirically as our data sources increase and will correspond to ratios developed in financial observations.

There is a distinct correlation between the executive of yesterday who early understood the significance of improving productive efficiency and the executive of today who appreciates and develops the techniques now available to measure and improve administrative control and efficiency. ► END



This article is one of a series illustrating and explaining the use of various purchasing forms. Forms used in this series have been selected from those supplied by purchasing organizations around the country.

The forms shown here were furnished by Director of Purchasing L. J. McLeod, Eastern Air Lines, Miami, Florida.



PURCHASE AUTHORIZATION

DATE _____ 64773

DEPT. _____

DESCRIPTION

RECOMMENDED

DISPOSITION OF MATERIAL

REFERENCE:

A.V.O. NO. _____

JOB NO. _____ E.A. NO. _____

EXPLANATION: _____

DELIVERY REQUESTED

COST

UNIT

TOTAL

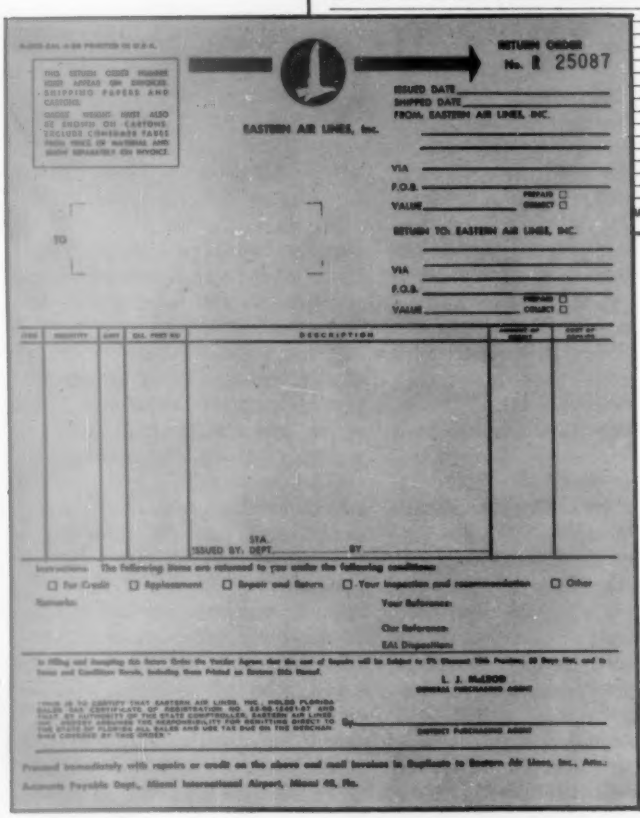
TOTAL COST OF THIS PURCHASE AUTHORIZATION

APPROVED BY:

CHECKED BY:

PURCHASING DEPARTMENT COPY

REQUISITION for non-stock items and new items for stock looks complicated, but Eastern finds that it needs all this information to maintain close control.



RETURN ORDER

No. R 25087

EASTERN AIR LINES, Inc.

ISSUED DATE _____

SHIPPED DATE _____

FROM: EASTERN AIR LINES, INC.

VIA _____

F.O.B. _____ PREPAID ☐

VALUE _____ COLLECT ☐

TO

RETURN TO: EASTERN AIR LINES, INC.

VIA _____

F.O.B. _____ PREPAID ☐

VALUE _____ COLLECT ☐

DESCRIPTION

ISSUED BY: DEPT. _____ STA. _____ BY _____

Instructions: The following items are returned to you under the following conditions:

☐ For Credit ☐ Replacement ☐ Repair and Return ☐ Your Inspection and recommendation ☐ Other

Remarks:

Your Reference:

Our Reference:

EAL Disposition:

L. J. McLEOD

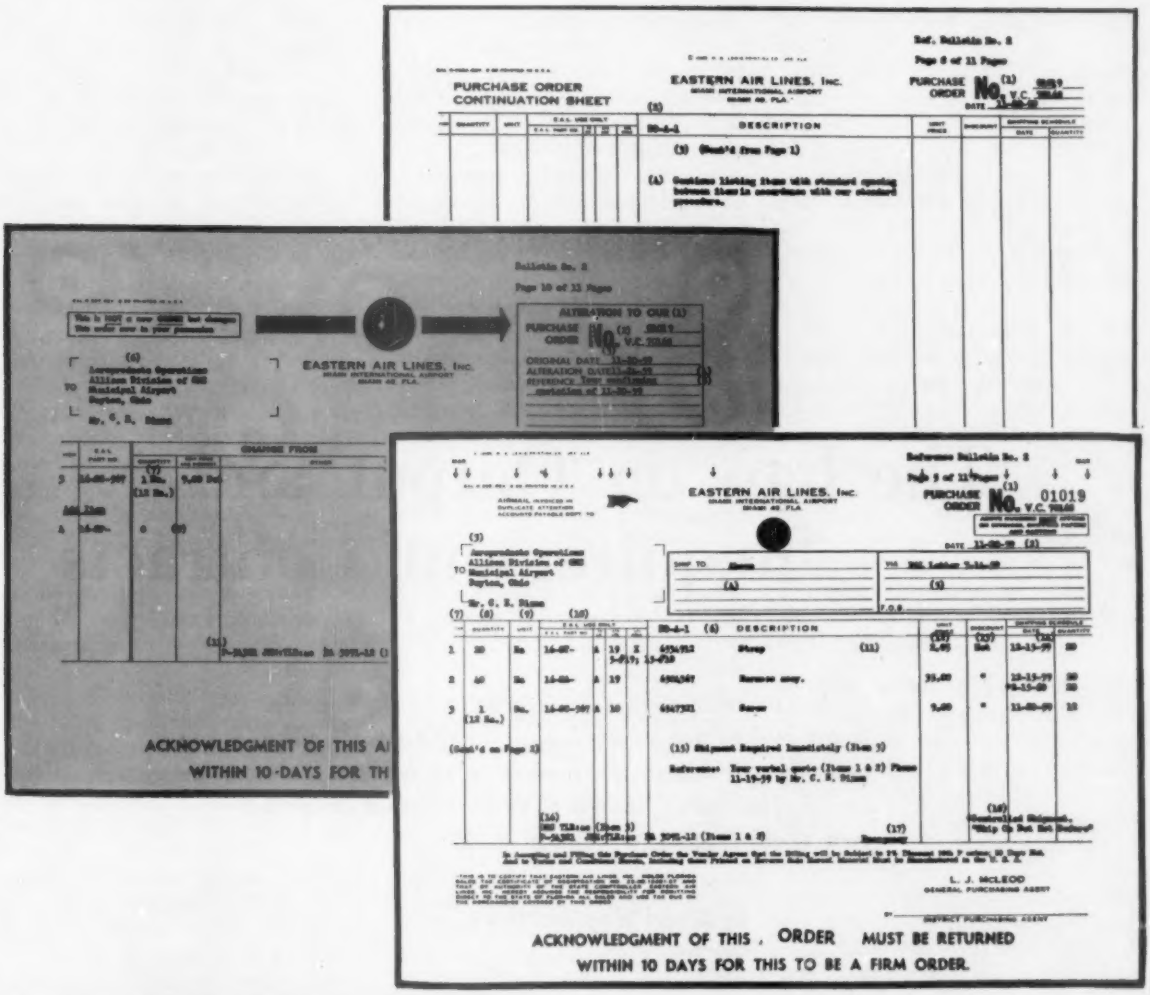
GENERAL PURCHASING AGENT

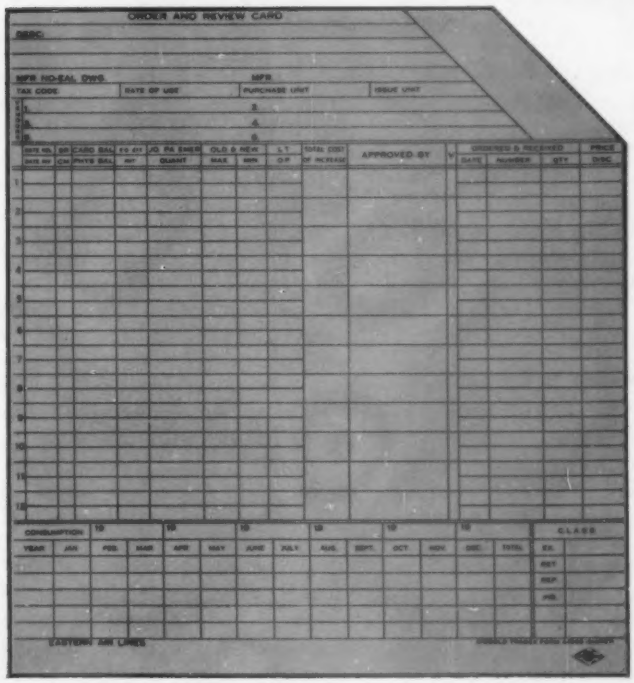
By: _____

DISTRICT PURCHASING AGENT

Forward immediately with repairs or credit on the above and mail invoices in Duplicate to Eastern Air Lines, Inc., Attn.: Accounts Payable Dept., Miami International Airport, Miami 48, Fla.

RETURN ORDER is the essence of simplicity but still covers all the essentials.





PURCHASE ORDER and supplementary forms, such as the continuation sheet and the change order are all similar in style. (The sample forms shown here are from Eastern's purchasing manual. The numbers on these samples refer to instructions in the purchasing manual.)

ORDER AND REVIEW CARD is used to reorder stock items and also contains inventory information. It is kept up to date by stores control and is routed to purchasing whenever an order has to be placed.

The Law on 'Output' and 'Requirement' Contracts

By law a contract must be definite to be enforceable. But this does not mean that an order must state the quantity purchased. An agreement to accept, for a specified period of time, the vendor's output or one's own requirements, is equally valid.

By Albert Woodruff Gray,
Legal Editor

SHORTLY after a Texas gas distributor had contracted to buy a manufacturer's entire output, the seller sued. The buyer, he said, refused deliveries which under the contract he was obliged to accept. The buyer, on the other hand, maintained that his obligation was limited to accepting only the amount he needed.

When the case came to trial, the court decided that the buyer was obliged to accept delivery of the manufacturer's entire output. This type of contract, the court said, "may be regarded as within one or the other of two classes of contracts involving sales of personal property. . . . 'output contracts' and 'requirement contracts.'

"A sale of the entire output of a certain article produced by the seller during a specified time, binds the seller to deliver and the buyer to accept all that the seller produces."

Only in requirement contracts, the court added, is the seller bound to deliver only the goods called for by the buyer within the limits of his requirements. The buyer is then bound to accept all deliveries tendered within such limits.

No More Money In the Bank

One of the controversial features of output and requirement contracts came before a federal court several years ago when the United Cigar Stores Co., which had agreed to buy certain of its requirements for ten years from a particular seller, went bankrupt.

The seller insisted that United Cigars abandonment of its business and its failure to continue its purchases for the ten year period was a breach of contract, for which he was entitled to compensation in damages from the assets of the bankrupt United Cigar Stores Co.

In this particular instance the court said:

"The buyer in a requirements contract surrenders his right to buy from anyone he pleases. If he has requirements he is bound to satisfy them through the seller alone. So too with the seller in an output contract, he has given up his right to sell at large. In both cases the obligation is a real and not an illusory one."

But the court recognized that changes may occur during the period of the agreement under which either the production or requirements decline or cease

entirely. "If the buyer's requirements taper off or altogether cease because of a change in his needs or because of a sale or discontinuance of his whole business, there is no default. He did not agree to buy any specified quantity but only his requirements.

Act in Good Faith

"No promise to continue to have requirements will be read into the contract. Subterfuges or evasions would doubtless not be tolerated, but the buyer's conduct in good faith determines his requirements. The same effect is given to output contracts. If the seller cuts down his manufacture or even closes up his plant in good faith he has still performed his undertaking. The weight of authority supports this construction of the ordinary requirements contract and the ordinary output contract."

In a Wisconsin case a lumber contract contained this clause: "The said party hereby agrees to sell to said second party all the western pine lumber he will manufacture or own during the season."

When lumber prices dropped the buyer refused delivery. The seller promptly sued for damages in what he claimed to be a breach of contract. In its defense the purchaser contended that the contract was void and unenforceable for lack of certainty.

However, the federal court had this to say: "A contract is void because of uncertainty only when it is so worded that the intention of the parties cannot be deduced therefrom. If the intention be clear the mere uncertainty of amount involved does not invalidate the obligation.

"The parties had a right to make such a contract even though the amount that would be deliverable thereunder was not specified and was, in a sense, optional with the seller. The contract expresses without uncertainty the intention of obtaining all the lumber the seller might acquire and manufacture during the season."

Although it is axiomatic in contract law that the agreement must be definite, it does not follow that this definiteness is restricted to weight or quantity. In the place of these measures a time period may be used as a yardstick to determine quantity or weight.

This point was brought out in a suit involving the purchase of a year's supply of cement. The contract stipulated that the manufacturer would sell and the customer buy the entire output of the manufacturer's Michigan plant for one year. But the mill was new and after repeated delays and disappointments in the quantity delivered, the customer wrote:

"We will make no remittance while we ascertain the effect on our sales of orders for cement which you could not fill. Our losses are heavy and in all likelihood exceed the amount we owe you. We will soon send you a statement of losses caused by your failure to comply with your contract."

When the seller sued for the unpaid balance on its account the purchaser claimed as damages the value of those orders the manufacturer failed to fill.

At full capacity the output of this plant would have been approximately 300,000 barrels a year. The purchaser contended that under the agreement for the sale of its entire output, the seller was obligated to operate its plant to its full extent.

Specify Quantity Required

The court, however, held that no damages were recoverable for the vendor's failure to maintain the production the purchaser had anticipated. It said: "It would seem clear that the output of the plant for the year was the cement manufactured at the plant during the year. . . . "If the purchaser was not satisfied to take the output of the plant for a year but desired to bind the manufacturer to furnish a certain number of barrels of cement during that time, he should have specified in the contract the number of barrels of cement that were to be shipped by the manufacturer during that year.

"It is argued that the parties intended that the plant should be operated to its full capacity and that the purchaser should receive during the year what cement could be reasonably produced by the plant when running at its full capacity. The contract does not so state and the court cannot import into the contract a provision which the parties have omitted therefrom. To do so would be to make a new contract."

Another aspect, and one that has been the source of many lawsuits, is that contracts for the purchase of an entire output or for all requirements, must be more than an option on the part



"If the buyer's requirements taper off or altogether cease because of a change in his needs there is no default. He did not agree to buy any specified quantity but only his requirements. No promise to continue to have requirements will be read into the contract."

of the purchaser to buy or the producer to sell.

This was brought out in a contract before a federal court in Tennessee which stipulated that a manufacturer would sell the purchaser "its entire consumption." When the manufacturer failed to ship as requested, the customer sued.

"A contract to buy all that one may require for one's own use in a particular business is a very different thing from a promise to buy all that one may desire or all that one may order," the court said.

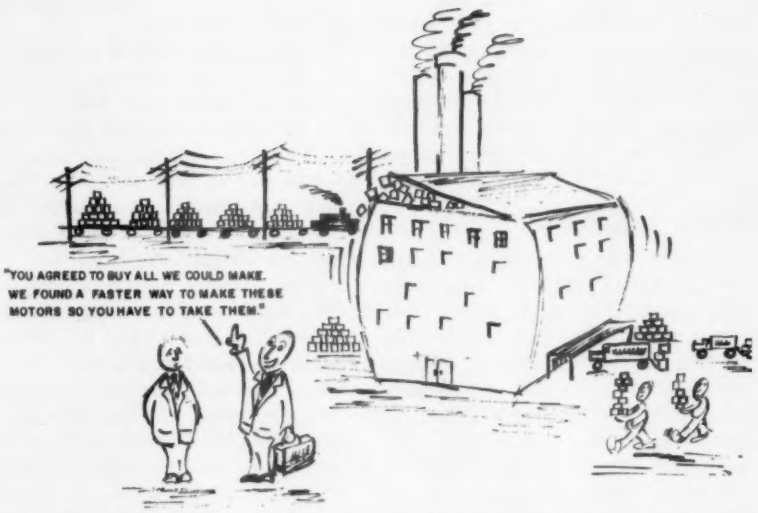
"The promise to take all that one can consume would be broken by buying from another and it is this obligation to take the entire supply of an established business that saves the mutual character of the agreement. The contract thus interpreted is distinguishable from a class of cases where the agreement was held to be a mere option."

"Hence it follows that nothing can be more contradictory to such an obligation than a liberty in either of the parties to perform it or not as he may please. An agreement giving such a liberty would be absolutely void for want of obligation."

Both Parties Must Agree

Another problem, emphasized in a recent decision by the Missouri Supreme Court, involves contracts which merely state the maximum quantity purchasable by the buyer. "The rules applicable to contracts of this class," said the court, "may be thus briefly stated. A contract for the future delivery of personal property is void for want of consideration and mutuality if the quantity to be delivered is conditioned by the will, wish or want of one of the parties; but it may be sustained if the quantity is ascertainable otherwise with reasonable certainty.

"An accepted offer to furnish or deliver such articles of personal property as shall be needed, required or consumed by an established business of the acceptor during a limited time is binding and may be enforced because it contains the implied agreement of the acceptor to purchase all the articles that shall be required in conducting his business during that time, from the party who makes the offer."



"A sale of the entire output of a certain article produced by the seller during a specified time, binds the seller to deliver and the buyer to accept all that the seller produces."

The whole question of indefiniteness in output and requirement contracts was clearly summarized by the United States Court of Appeals in a decision which has since become a leading authority. This case hinged on a memorandum between a manufacturer and a buyer. It read: "In accordance with our personal conversation we have entered your order for anything we can furnish from our warehouse, these discounts to apply until June 30th. I am writing this letter in duplicate and will thank you to sign and return one copy at your earliest convenience."

Look Before You Sign

A list of discounts was appended. The customer endorsed the memo below the word "accepted" and returned a copy to the manufacturer. Later he sued for damages incurred through a failure of the manufacturer to deliver the goods that he had ordered. The defense maintained that there was no agreement and no consideration.

The court, on the other hand, held the contract to be valid and definite. It said: "The contracts to furnish such material as one may need in his business for a specified time are, by the weight of authority, held mutual and binding on the parties where the nature of the purchaser's business is such as to make the quantity of the article he will need subject to a reasonably accurate estimate.

"The basis of this rule is that the purchaser's obligation to buy to the extent of his needs supplies mutuality. The pivotal question thus is whether the agreement is to be construed as binding the buyer to so purchase, for if so, it would not in our opinion, be invalid for lack of certainty as to the amount the seller would have in its warehouse and which the purchaser would be obliged to take.

"Not only would the amount be susceptible of determination within reasonable limits but the purchaser's agreement to buy what would be on hand would furnish a consideration for the promise.

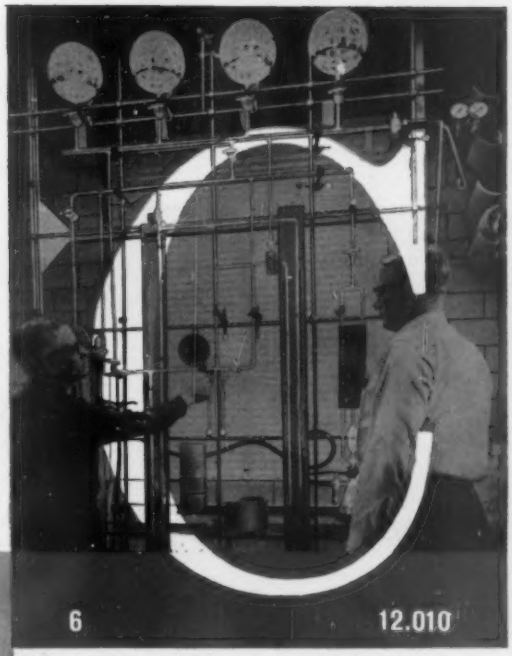
"Considering the writing as evidencing merely an offer by the manufacturer to sell and an acceptance by the purchaser of the offer, it is plain that an express contract resulted, not invalid for indefiniteness in respect of quantity." ► END

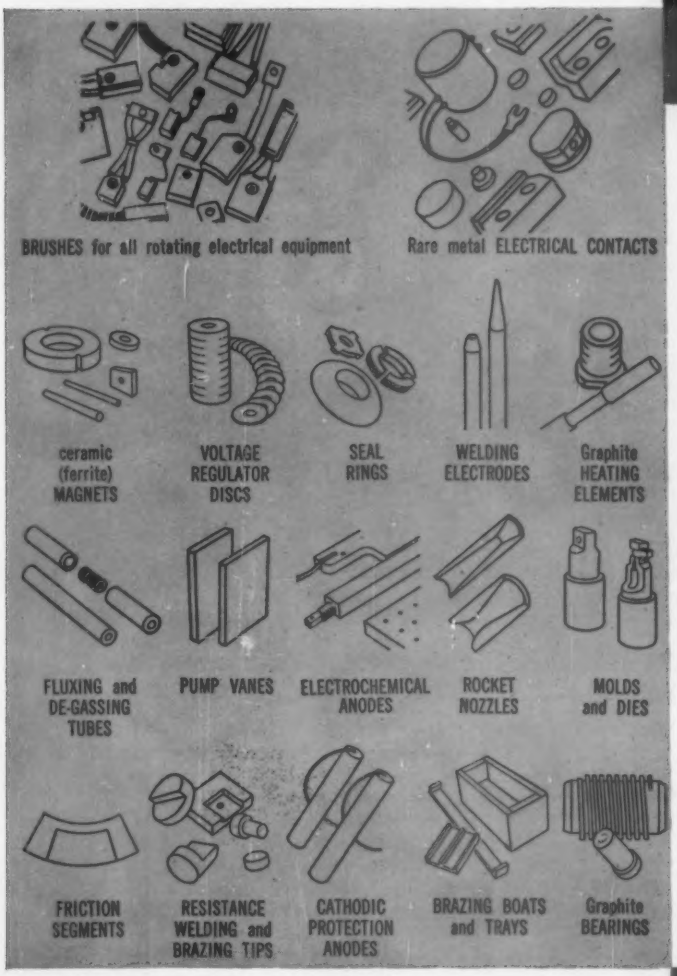
from specialized

Powder Metallurgy Research

. . . new uses and improved materials based on

Nature's Oldest Element





Many of industry's most useful components are made by Stackpole from Carbon and Graphite Powders.

Carbon, its crystalline kin, graphite, and various metal powders are the raw materials of Stackpole Research—a specialized branch of powder blending and molding aimed at developing new uses and improved manufacturing techniques for "Everything in Carbon but Diamonds."

Here, one of many new instruments in the expanded Stackpole Research Laboratories—a nitrogen absorption analyzer — measures powder surface areas as part of a program to develop economical new techniques for milling carbon powders.

STACKPOLE

STACKPOLE CARBON COMPANY
St. Marys, Pennsylvania

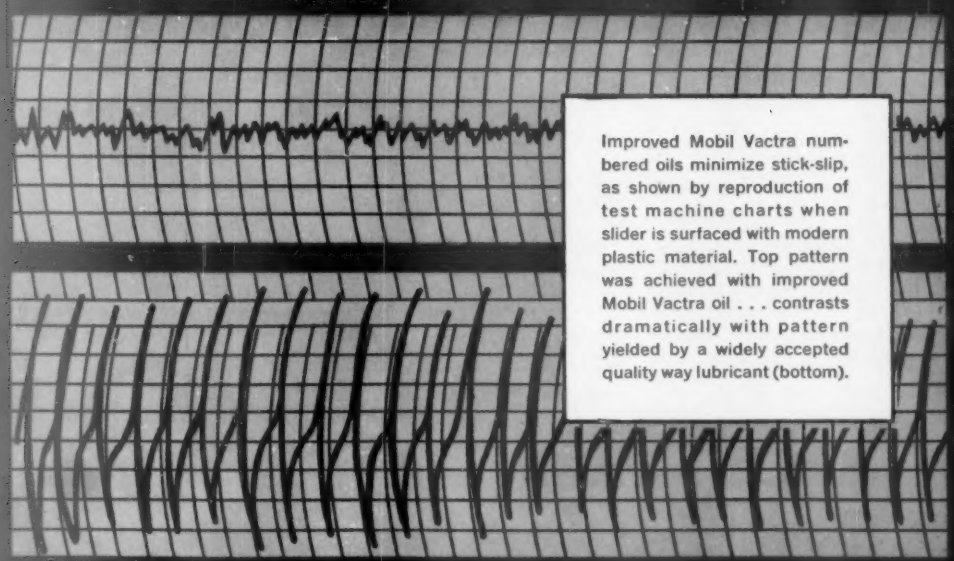
For More Facts Write No. 205 on Information Card—Page 32

For More Facts About Ad on Following Page Write in No. 206→

NOW! WAY LUBRICANTS WITH ALL SIX



Stick-slip tester developed by Mobil's research laboratories closely simulates operating conditions of today's machine tools . . . records stick-slip electronically as weighted slider is pulled across lubricated cast iron bed.



Improved Mobil Vactra numbered oils minimize stick-slip, as shown by reproduction of test machine charts when slider is surfaced with modern plastic material. Top pattern was achieved with improved Mobil Vactra oil . . . contrasts dramatically with pattern yielded by a widely accepted quality way lubricant (bottom).

QUALITIES REQUIRED BY TODAY'S MACHINE TOOLS!

IMPROVED MOBIL VACTRA Nos. 1·2·3·4

Excellent for all way systems, all way surfaces, all operating conditions!

To meet the diverse requirements of today's complex machine tools, way lubricants must function effectively under a variety of operating conditions . . . must possess not one or two, but *six* important capabilities.

Now you can get all six—with Improved Mobil Vactra® oils Nos. 1-4, inclusive!

These improved Mobil Vactra oils provide these advantages: • Minimum stick-slip on all types of ways—steel, cast iron or plastic. • Control of table "float" through correct viscosity—without risk of film failure and wear. • Protection against way scoring through controlled EP qualities. • Prevention of lubricant filter clogging. • Protection against rust and corrosion. • Stability under all normal operating conditions.

Improved Mobil Vactra oils Nos. 1-4 offer these benefits:

- **Increased Machine Availability,** because less downtime is required for adjustments...especially significant with today's high overhead and burden rates.
- **Fewer Rejects,** through greater precision and better finishes . . . vitally important with today's closer tolerances and the high cost of finished pieces.
- **Minimum Maintenance Costs,** through effective protection of critical way surfaces.

Available in four viscosities, Improved Mobil Vactra numbered oils permit the selection of a grade exactly suited to any critical operating condition. For complete details, call your Mobil Representative or use the coupon below.

Mobil

MOBIL OIL COMPANY
150 East 42nd Street
New York 17, N. Y.

Mobil Oil Company
Room 2057-H
150 East 42nd Street
New York 17, N. Y.

Gentlemen: I am interested in using Mobil Vactra Nos. 1-4 to help alleviate way lubrication problems at my plant.

*Name*_____

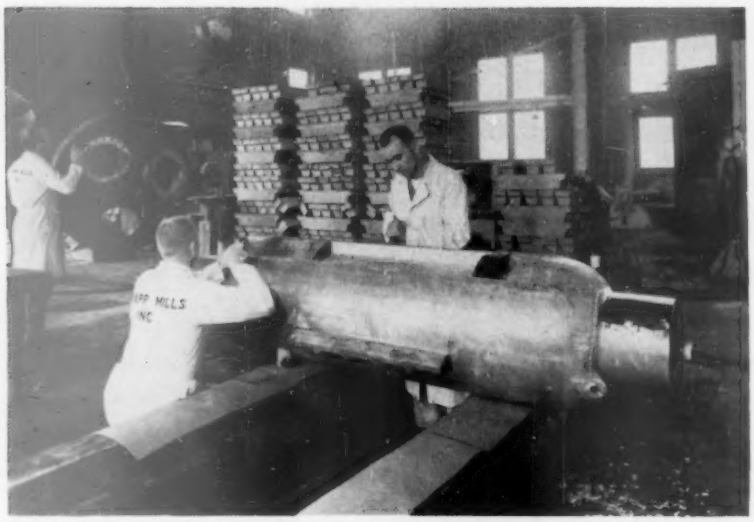
*Position*_____

*Company*_____

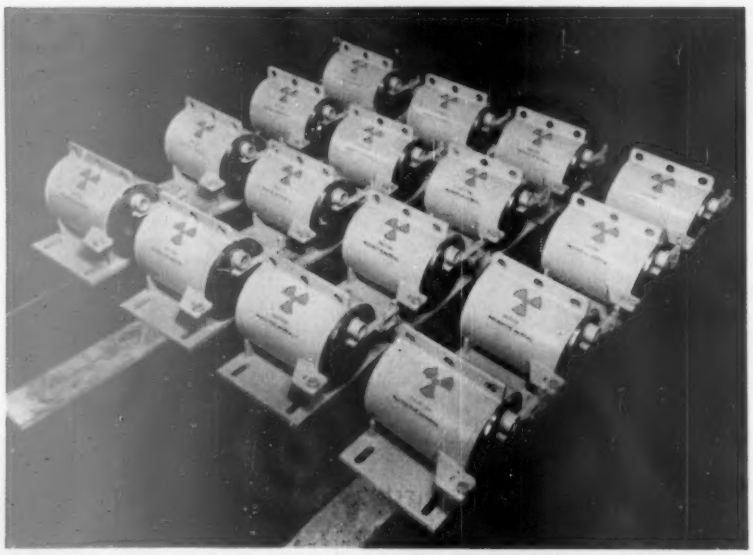
*Address*_____

*City*_____ *State*_____

Clad Metals Provide Nuclear Age Protection



Demineralizers for nuclear ships are made of Nicrolum, lead-clad stainless steel. They remove radioactive minerals and foreign matter from reactor cooling water.



Nuclear gauges are shielded with lead. Gamma radiation produced by a nuclear source measures the thickness of steel during manufacture.

CLAD metals that shield from corrosion and radioactivity are already important in the nuclear and chemical industries. But the thousands of tons being produced today are only a small portion of what industry will soon require. Experts estimate that in ten years most major industries will be using some form of nuclear energy —as a power source, for testing, or in metallurgical or chemical processes. The need for shielding metals will rise accordingly.

A name to watch in this field is Insmetals—lead-clad metals that combine the shielding properties of lead with the structural strength, conductivity, etc., of other metals. Although developed by the International Shielding Industries, Ltd. and protected by patents, Insmetals are not the product of one manufacturer. In the U. S. they are produced by Knapp Mills Inc. of Long Island City, N. Y., and by the Pacific Coast Engineering Co., Alameda, Calif. There are also producers in Canada, Britain, France, and Italy. Others are being licensed, both in the U. S. and overseas.

Lead has long been valuable in corrosion protection, and its ability to absorb gamma radiation is well known. However, lack of structural strength and inadequate physical properties often make it impossible to use in fabricating chemical apparatus and mobile nuclear systems that have to withstand shock and vibration.

Insmetals solve these problems by metallurgically bonding lead to metals such as aluminum, steel, and copper. The lead may be from

(*Please turn to page* 98)



"Amazing Demonstration of Wire Rope Pliability!"

ACCO'S NEW HI-PLI SLINGS HANDLE LIKE HEMP AND STRAIGHTEN OUT WHEN RELEASED

- ***So pliable it can be tied in knots***
- ***It makes fast, easy work of any lifting job***
- ***It combines the pliability of hemp with the strength of steel***
- ***It's practically kink-proof—and completely free of crankiness***
- ***HI-PLI slings last longer—can be used over and over again***

Twist them, knot them, bend them—and HI-PLI slings always return to their original shape. This amazing pliability comes from ACCO'S arrangement of six ropes laid around one. HI-PLI slings also have ACCO's patented Dualoc endings which double-lock the sling ends. They stay clean and pleasant to handle, too—thanks to their durable Galacco finish which resists rust.

HI-PLI slings, like all ACCO slings, are registered safe. This means they have been factory proof-tested at twice load-carrying capacity before they are given an ACCO tag and certificate of registration.



Ask your distributor for HI-PLI slings
• Or write us at Wilkes-Barre, Pa., for our new **Catalog 10** which describes our Hi-Pli, Strand-Laid and Braided slings.



HI-PLI ACCO Registered® SLINGS

Wire Rope Sling Department • American Chain & Cable Company, Inc.

Atlanta, Chicago, Denver, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh, Portland, Ore., San Francisco, Bridgeport, Conn. • *In Canada:* Dominion Chain Company, Ltd., Niagara Falls, Ontario

For More Facts Write No. 207 on Information Card—Page 32

NEW *from* NORTON

Segments of new 23 ALUNDUM abrasive . . .*

premium performance at non-premium price

Surface grinding gets a real performance-lift from Norton — combined with a definite economy!

Newest development for segments for vertical spindle surface grinders is 23 ALUNDUM abrasive.

This is no ordinary aluminum oxide. Here you get premium toughness and sharpness — plus the friable nature that eliminates dressing.

Two other big advantages are versatility and uniformity. 23 ALUNDUM abrasive is ideal for surface grinding carbon steels, mild steels, stainless steels, Meehanite and aluminum. And to this broad range 23 ALUNDUM segments bring maximum uniformity of performance — the results of a two-year Norton project to develop the closest possible duplication of structure and dimensions.

Users already know these benefits

Segments of 23 ALUNDUM abrasive have had thorough test runs from coast to coast. The following reports from Norton surface grinding customers are typical:

- *"With the new segments we get freer cutting and higher production rate."*
- *"Very good on all our metals. Required no dressing."*
- *"No burn, even with full power. Better finish, longer life on all metals. We're standardizing on '23'."*
- *"Best segments we've ever used for general purposes, including chrome plate."*
- *"Much less dressing, faster cut, less heat."*

Find out how 23 ALUNDUM segments can benefit your own production. See your Norton Distributor about a test run in your plant. Or your Norton Man will give you plenty of facts about this big, new advancement in surface grinding. NORTON COMPANY, General offices, Worcester 6, Massachusetts. Plants and distributors around the world.

W-2001

NORTON
ABRASIVES

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

Making better products . . . to make your products better

NORTON PRODUCTS: Abrasives • Grinding Wheels • Machine Tools • Refractories • Electro-Chemicals — BEHR-MANNING DIVISION: Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes

For More Facts Write No. 208 on Information Card—Page 32



"Chase® metals save 50% on buffing operations," *says John Linkamper, Purchasing Agent for Coppercraft Guild Gift Wares*

Coppercraft Guild Gift Ware is sold in the home, from samples—and has won its position of leadership through its matchless appearance. The slightest flaw in surface or finish could prevent a sale to Coppercraft Guild's discriminating customers. Mr. Linkamper reports that Coppercraft, a division of Armor Bronze and Silver Co., has had uniformly high acceptance for 65 or more items they make using Chase brass and copper.

Prior to using Chase metals, production problems were caused by critical deep-draw operations and the need for lengthy buffing and polishing. Then Chase metallurgists were presented with the problems... recommended a Chase alloy which withstood the deep draw perfectly and provided a 50% reduction in buffing and polishing. Added advantage: the stocks of metal in the nearby Chase Multi-Metals Service Center made it possible for Coppercraft Guild to order from stock, saving on storage space, metals inventory and handling.

End result of this co-operation between Chase and the manufacturer is reported to be "the exact appearance and quality we want... fewer rejects... 50% reduction in buffing costs... enabling us to lower our costs."

Chase metals and Chase skills are ready to serve you in the same way.



NEW 3-MARK ROD is the free-cutting brass rod designed by Chase to meet the demands of modern high-speed machines. Cuts freely with short chips... is extremely straight to cut down whip. Check coupon for details on 3-Mark Rod.



THIS CHASE FORGING, for the trunnion of the gauge shown above, gives excellent dimensional accuracy. Chase forgings are die-pressed, made to close tolerances, free from pits and blowholes. Need far less finishing, too.



NEED STAINLESS OR ALUMINUM? The Chase Multi-Metals Service Center nearest you has the types and quantities you want. Call for a copy of the latest stock lists, or check and return the coupon at the right.

ALUMINUM BRASS·COPPER STAINLESS

Chase Multi-Metals Service Centers:

ATLANTA 10, GA.
695 Stewart Ave., S.W.
Tel. PLaza 5-5731

BALTIMORE 30, MD.
1315 Key Highway
Tel. PLaza 2-2565

BOSTON 4, MASS.
411 "D" Street
Tel. LIberty 2-0126

CHARLOTTE 2, N. C.
222 S. Church St.
Tel. EDison 2-4152

CHICAGO 39, ILL.
5401 W. Grand Ave.
Tel. TUxedo 9-4000

CINCINNATI 2, OHIO
222 Post Square
Tel. PArkway 1-3326

CLEVELAND 3, OHIO
4000 Chester Ave.
Tel. HEnderson 2-2300

DALLAS 7, TEXAS
5052 Sharp St.
Tel. FLeetwood 7-8187

DENVER 16, COLORADO
5101 Colorado Blvd.
Tel. DUdley 8-2441

DETROIT 38, MICHIGAN
14480 Woodrow Wilson Ave.
Tel. TOwnsend 8-2939

GRAND RAPIDS 2, MICH.
200 Division Ave., N.
Tel. GLendale 9-7136

HOUSTON 1, TEXAS
16 Drennan Street
Tel. CApitol 2-7266

INDIANAPOLIS 21, IND.
1609 Oliver Avenue
Tel. MElrose 7-1543

KANSAS CITY 8, MO.
1710 Washington St.
Tel. VIctor 2-1710

LOS ANGELES 54, CALIF.
6500 E. Washington Blvd.
Tel. RAymond 3-5351

MILWAUKEE 1, WIS.
1741 W. St. Paul Ave.
Tel. DIvision 2-7630

MINNEAPOLIS 3, MINN.
145 N. Tenth St.
Tel. FEderal 6-4661

NEW ORLEANS 25, LA.
1000 So. Jeff. Davis Parkway
Tel. HUnter 6-5441

NEW YORK—NEWARK
55-60 58th St.
MASPETH 78, L. I., N. Y.
Tel. TWining 4-0500
Tel. Bigelow 8-1700

PHILADELPHIA 40, PA.
20th and Venango Sts.
Tel. BAldwin 3-5800

PITTSBURGH 33, PA.
1001 Brighton Road
Tel. CEdar 1-7900

PROVIDENCE 1, R. I.
66 Branch Avenue
Tel. DExter 1-2300

ROCHESTER 14, N. Y.
45 Exchange St.
Tel. HAmilton 6-3959

ST. LOUIS 10, MO.
4641 McRee Ave.
Tel. PRospect 6-3111

SO. SAN FRANCISCO, CALIF.
230 Shaw Road
Tel. JUno 3-4994 or PLaza 6-4809

SEATTLE 4, WASH.
1957 First Ave., S.
Tel. MAin 4-1862

WATERBURY 20, CONN.
40 East Farm St.
Tel. PLaza 6-9444, Ext. 209

Chase®

BRASS & COPPER CO. WATERBURY 20, CONN.
Subsidiary of ***Kennecott Copper Corporation***

CHASE BRASS & COPPER CO.
DEPT. P-12, WATERBURY 20, CONN.

Please send me information on the following:

☐ Sheet and Strip ☐ Aluminum Stock List
☐ Stainless Steel Stock List ☐ Chase 3-Mark Rod
☐ Forgings

NAME & TITLE_____

FIRM_____

STREET ADDRESS_____

CITY_____ ZONE____ STATE_____

For More Facts Write No. 209 on Information Card—Page 32



RIGID No. 2-S Spiral Reamer
⅛" to 2" Capacity . . . Self-Feeding for Least Effort

For Smooth, Easy Reaming it has to be

RIGID®



No. 2
⅛" to 2" Capacity

No. 3
⅜" to 3" Capacity

RIGID
"LonGrip" Reamers
No Thinned or Flared Walls

Take your choice—Spiral or "LonGrip"—you can't beat these RIGID Reamers. For hand reaming, you probably prefer the effortless self-feeding Spiral; for power use, the "LonGrip" five-fluted reamers. Heat-treated cutting edges offer extra-long service . . . will not dig in and thin or flare walls. All RIGID Ratchet Reamers come equipped with handle.

Your Supply House has them.
For smoother, faster reaming
order yours today!

RIGID®
The Ridge Tool Company, Elyria, Ohio, U.S.A.

For More Facts Write No. 210 on Information Card—Page 32

Products

(*Continued from page 92*)

⅛" to over a foot thick, as required by the application. The metallurgical bond means that the lead is alloyed with the base metal at the interface; without it the metals would separate when subjected to mechanical or thermal shock.

The Insmetals have trade names composed of a Latin root describing the base metal and the suffix "lum" (from "plumbum" which means lead). Here are some of the important ones and their uses.

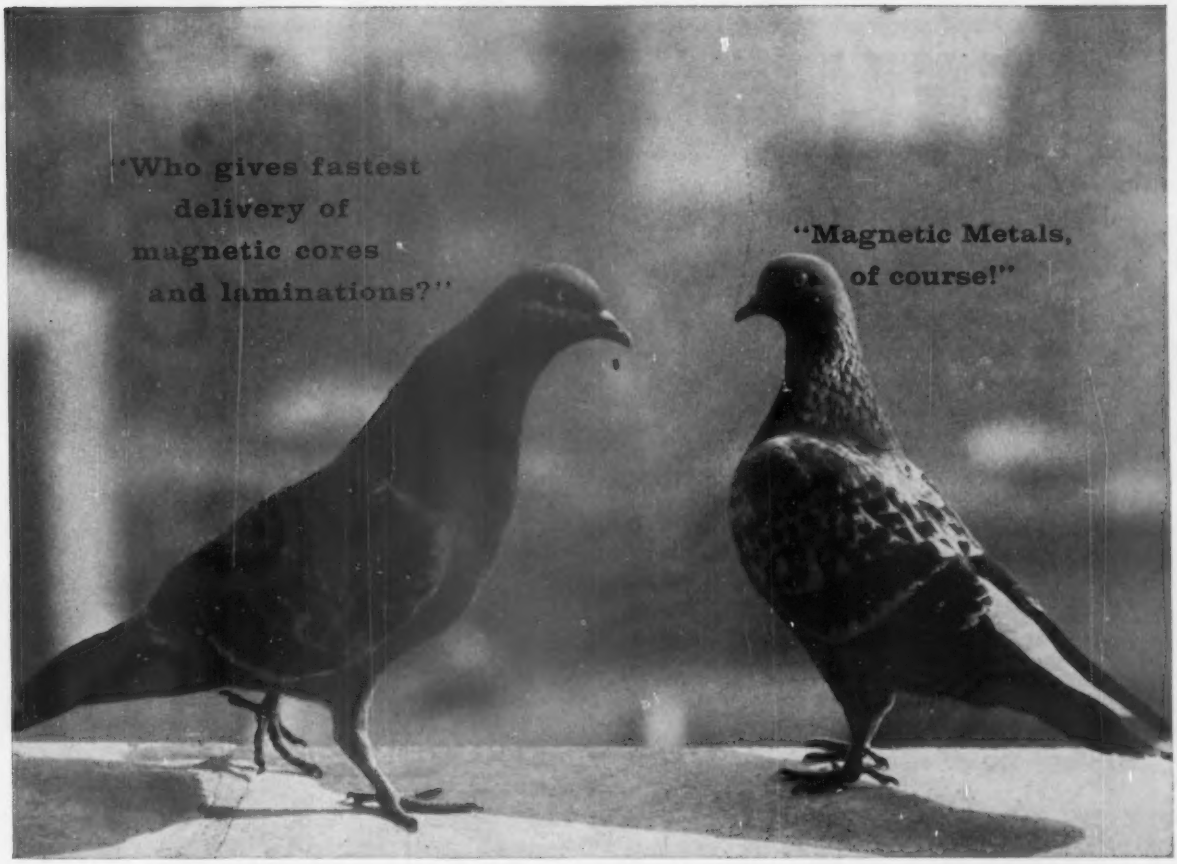
BAUXILUM—aluminum clad with lead. This is particularly useful in applications subject to rapid thermal changes. Because the metals can be alloyed to produce minimum differential contraction or expansion, separation is avoided. Bauxilum heating and cooling coils withstand high steam pressures and the aluminum surface has high heat transfer.

CUPRALUM—Copper bonded to lead. This combines the shielding and corrosion resistance of lead with the heat transfer value, electrical properties, and corrosion value of copper. Cupralum tubing is especially valuable in equipment for cooling or heating corrosive acids and in heat exchangers. Anodes of Cupralum have proved useful to conduct electricity through corrosive electrolytes in chrome plating.

FERROLUM—Carbon steel and lead. This provides lead shielding with the low cost, strength, heat transfer, and fabricating versatility of steel. The thickness of the steel may range from thin sheetmetal to 6" armor plate. Ferrolum is mainly used to fabricate processing equipment of all types: storage vessels, piping, tanks, and coils. It is also used in the nuclear field for shielding mobile reactors —as in ships and shipping and storage containers for radioactive materials.

NICROLUM—Any of the stainless steels clad with lead. This is suited for services which require the properties of stainless steel: corrosion resistance, ease of decontamination or sanitary qualities. It may be used to handle a group of radioactive corrosives.

Write No. 18 on Information Card—Page 32



It's the wise bird who turns to Magnetic Metals for hurry-up service on magnetic cores and transformer laminations. Magnetic Metals keeps on hand an enormous stock of lamination dies, always ready to stamp out the laminations you need, without the delay or added expense of tooling up. And Magnetic Metals stock of magnetic alloys—largest commercial stock in the world—makes immediately available to you the widest choice of magnetic characteristics.

At both our East and West Coast plants, Centricores® and Powdered Permalloy Filtoroid® cores are stocked in all standard permeabilities and sizes for immediate shipment, and specials can be made to your specifications on short notice.

In addition to ultra-fast delivery, you get expert engineering guidance on the use of magnetic materials and—most important—the consistent uniformity of performance that sets Magnetic Metals cores and laminations apart.

Why not get in touch with Magnetic Metals today?

MAGNETIC METALS

Magnetic Metals Company

Hayes Avenue at 21st Street, Camden 1, N.J.
853 Production Place, Newport Beach, California
transformer laminations • motor laminations • tape-wound cores
powdered molybdenum permalloy cores • electromagnetic shields

For More Facts Write No. 211 on Information Card—Page 32

FELT
BY FELTERS

PROVIDES DEPENDABLE,
LOW-COST PARTS FOR

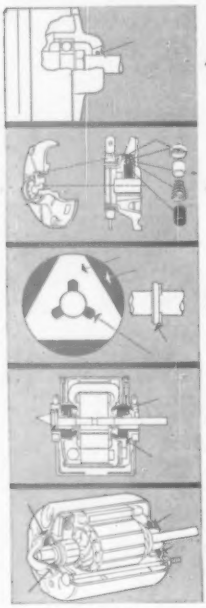
ELECTRIC MOTORS

Seals . . . wicks . . . lubricators . . . washers . . . gaskets — are all vital electric motor parts that benefit from Felt by Felters.

A special Felters' "Engineered Fabrication" processes felt to specific thickness, density, hardness, and resiliency; and provides special characteristics such as absorption, stiffness, water repellency and flameproofing.

And, new felt and plastic laminates, called PlastiFelts, use synthetics such as Nylon, Teflon, Hycar and rubber to provide an even wider range of application, plus greatly improved performance.

These are some of the many electric motor applications where Felt by Felters offers both a low-cost and high performance material for non-metallic parts.



Felt seal inserted around shaft opening retains grease and keeps out foreign matter.

This self-oiler uses a felt wick, bearing against the shaft under spring pressure, for constant lubrication.

This is a thrust washer designed for double duty as a lubricator by the use of a felt ring and lubricating notches.

Lifetime bearing lubrication is possible by selection of correct SAE grade, and designing into sealed bearing.

Felters' "Engineered Fabrication" makes it possible to specify felt shapes for a complete motor and shaft lubricating system, combining reservoirs, and wicking, and directing oil flow to all required areas.



To get the most out of Felt, send for the Felters Design Book — a complete digest on properties and applications. Write, today.

Ask for **FELT** *from . . .*

The **FELTERS** Co.

239 SOUTH STREET
BOSTON 11, MASSACHUSETTS

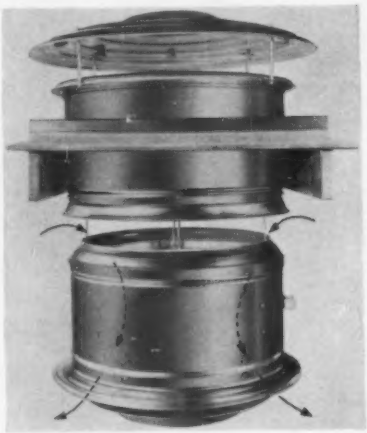
Pioneer Producers of Felt and Synthetic Non-Woven Fabrics M5-6

For More Facts Write No. 212 on Information Card—Page 32



Products

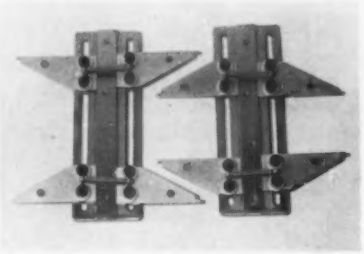
Dual Purpose Ventilator Cuts Heating Costs



A dual purpose ventilator can cut heating costs by as much as 50%. In winter unit recovers heat trapped under the roof line and returns it to floor area. In summer same unit will exhaust air from within building. Sizes range from 3,000 to 23,000 CFM. **Genie-Air Products, Div. of N.T.W. Corp., 3001 E. 11th St., Los Angeles 23, Calif.**

Write No. 19 on Information Card—Page 32

Go-No Go Gage Has Adjustable Arms



An adjustable go-no go gage has two pairs of independently adjustable, oppositely opposed and spring loaded gaging arms. Pair on one side with green identification dots can be set for given go dimension (predetermined maximum tolerance), while the second pair with red identification dots is set for no-go dimension (predetermined minimum tolerance). Top capacity is 5 in. **Speed Tool Co., 1144 N. LaBrea Ave., Los Angeles 38, Calif.**

Write No. 20 on Information Card—Page 32

For More Facts About Ad on Facing Page Write in No. 213→

QUALIFIED

for better service to industry

your bearing specialist . . .

Adequate inventories of the finest American-made bearings and power transmission parts . . . efficient, experienced staffs of personnel . . . sound financial standing . . . a sincere desire to serve you well . . . these are the requirements for membership in the ASSOCIATION OF BEARING SPECIALISTS. These qualifications are your assurance that when you deal with your BEARING SPECIALIST you receive the finest replacement parts and the fastest, most efficient service available to industry.

Add a qualified BEARING SPECIALIST to your production team today. Call your nearest member of ABS!



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Alexandria, Virginia
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Allentown, Pennsylvania
Keystone Bearing & Sup.

Amarillo, Texas
Capitol Bearing Service

Anchorage, Alaska
Bearing Eng. & Supply Co.

Austin, Texas
Capitol Bearing Service

Baton Rouge, Louisiana
Louisiana Bearings

Beaumont, Texas
Behring's, Inc.

Billings, Montana
Bearings Supply

Boise, Idaho
Western Bearing

Boston, Massachusetts
Bearings Specialty

Bridgeport, Connecticut
Bobker Bearings

Buffalo, New York
Buffalo Bearings

Cedar Rapids, Iowa
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Chattanooga, Tennessee
Volunteer Bearings

Chicago, Illinois
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Clifton, New Jersey
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Coastal Plains, Inc.

Davenport, Iowa
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Denver, Colorado
Allen Bearings Supply

Des Moines, Iowa
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Duluth, Minnesota
Minnesota Bearing

Detroit, Michigan
Michigan Bearing

El Dorado, Arkansas
Coastal Plains Supply

Eureka, California
Bearings & Trans. Prod.

Fairbanks, Alaska
Bearing Eng. & Supply Co.

Fargo, North Dakota
Western Bearing & Supply

Flagstaff, Arizona
Semon Ind. & Welding Supply

Glendale, Arizona
Semon Industrial Supply

Grand Junction, Colorado
Bearing & Power Transmission Co.

Grand Rapids, Michigan
Michigan Bearing

Green Bay, Wisconsin
Libert Bearing

Hibbing, Minnesota
Minnesota Bearing

Highland Park, New Jersey
Bobker Bearings

Houston, Texas
Behring's Bearings Service

Indianapolis, Indiana
Hoosier Bearing & Trans.

Jersey City, New Jersey
Bobker Bearings

Kansas City, Missouri
Bearing Distributors

Kearney, Nebraska
Precision Bearing & Trans. Co.

Lake Charles, Louisiana
Behring's Bearings

Lakeland, Florida
Miller Bearings

Little Rock, Arkansas
Allied-Arkansas Bearing

Long Island City, New York
Bobker Bearings

Los Angeles, California
General Bearings

Louisville, Kentucky
Bearings, Inc.

Lubbock, Texas
Bearing Specialists

Midland, Texas
Carpenter Bearing

Milwaukee, Wisconsin
Bearings, Inc.

Minneapolis, Minnesota
Minnesota Bearing

Monroe, Louisiana
Monroe Bearing & Supply

New Orleans, Louisiana
Industrial Bearing
New Orleans Belting & Bearing

New York, New York
Bobker Bearings

Newark, New Jersey
Bobker Bearings

Oakland, California
Bearing Industries

Odessa, Texas
Carpenter Bearing

Oklahoma City, Oklahoma
Fleck Bearing

Omaha, Nebraska
Precision Bearing & Trans.

Orlando, Florida
Miller Bearings

Phoenix, Arizona
Semon Bearing & Supply

Pittsburgh, Pennsylvania
Bearing Service

Pittsfield, Massachusetts
Bearing Distributors

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Western Bearings

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Behring's, Inc.

Portland, Oregon
McGuire Bearing Co.

Saginaw, Michigan
Michigan Bearing

St. Louis, Missouri
Bearings-Beltings & Supply Co.

St. Paul, Minnesota
Minnesota Bearing

Salt Lake City, Utah
Bearing Eng. & Sales

San Antonio, Texas
Capitol Bearing

San Francisco, California
Bearing Industries, Inc.

Santa Clara, California
Bearing Industries, Inc.

Seattle, Washington
Bearing Eng. & Supply Co.

Shreveport, Louisiana
Bearing & Trans. Co.

Sioux Falls, South Dakota
Western Bearing & Supply

Spartanburg, South Carolina
White Bearing

Spokane, Washington
Empire Bearing

Tampa, Florida
Miller Bearings

Toledo, Ohio
Binkelman Bearings

Trenton, New Jersey
Trenton Bearings

Troy, New York
Bearing Distributors

Tucson, Arizona
Semon Bearing & Ind. Supply

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Bearing, Chain & Supply

Westbury, New York
Bobker Bearings

Wichita, Kansas
B-R-C Bearing

Wilkes-Barre, Pennsylvania
Keystone Bearing & Supply

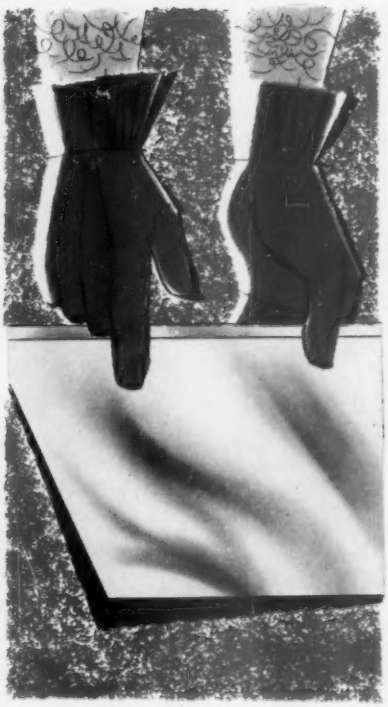
USS Amerstrip—everything about its method of manufacture has the stamp of precision. Just specify what you need in a cold rolled strip, whether it's a precise gauge, finish, edge, tolerance or temper and you get exactly what you specify. USS Amerstrip will keep your product quality high and consistent because of these six distinct advantages:

USS AMERSTRIP GIVES YOU PRECISELY



PRECISION FINISH

With USS Amerstrip we take special pains to give you a finish that is just right for the specific results you require in a finished product. We believe the Amerstrip finish is the finest you can get in the industry.



PRECISELY PREPARED EDGES

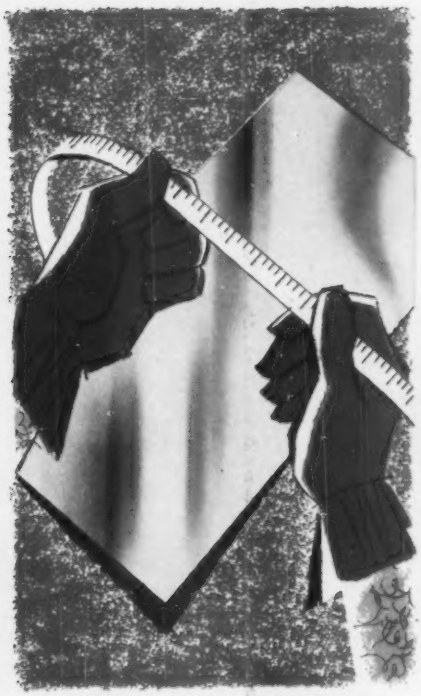
Because USS Amerstrip is produced in order-sized quantities engineered to your own specifications, we can give you precisely the edge finish you need. Choose your edge—square, standard, round, full round or bevel.



PRECISE TEMPERS

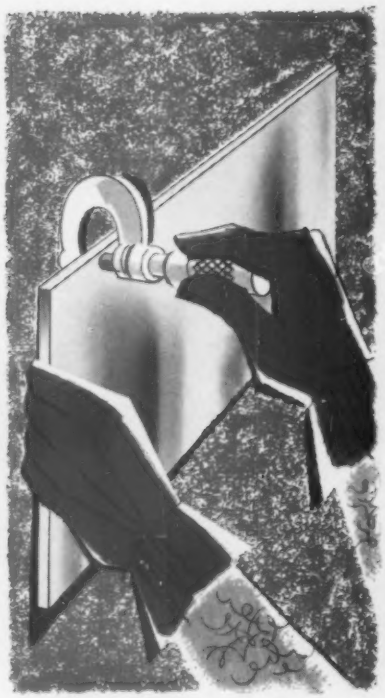
Whether your product must go through a deep draw or undergo other stringent forming operations, or if it requires a special temper for rigidity, you'll always get the correct temper for the job when you order USS Amerstrip.

WHAT YOU NEED IN A COLD ROLLED STRIP



PRECISE WIDTH TOLERANCES

When your fabricating machines require a special width strip, you can be sure that's the width you'll get with Amerstrip. We can produce USS Amerstrip within required tolerance limits to fit your special requirements.



PRECISE THICKNESS TOLERANCES

Whatever thickness tolerance your machines demand, you'll get it in Amerstrip. And it'll be precisely the same in every inch of Amerstrip ordered. Amerstrip can be rolled in thickness tolerances of plus or minus .0005 inches.



PRECISE UNIFORMITY

Regardless of the size of your order, every coil of USS Amerstrip comes off the line uniform in finish, temper, width and thickness. In short, USS Amerstrip's precision production assures a continuous run and high yield.

American Steel & Wire Representatives have the training and experience to give you expert guidance in fabrication and application of USS Amerstrip. They can show you how it contributes to a better finished product. To avail yourself of their services, call your nearest AS&W District Office. American Steel & Wire, 614 Superior Ave., N.W., Cleveland 13, Ohio.

USS and Amerstrip are registered trademarks

American Steel & Wire
Division of
United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributor
Tennessee Coal & Iron Division, Fairfield, Ala., Southern Distributors
United States Steel Export Company, New York

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MALLEABLE

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Eastern Malleable Iron Co., Naugatuck
New Haven Malleable Iron Co., New Haven 4

DELAWARE
Eastern Malleable Iron Co., Wilmington 99

ILLINOIS
Central Fdry. Div., Gen. Motors, Danville
Chicago Malleable Castings Co., Chicago 43
Moline Malleable Iron Co., St. Charles
National Mall. and Steel Castings Co., Cicero 50
Peoria Malleable Castings Co., Peoria 1
Wagner Castings Company, Decatur

INDIANA
Albion Malleable Iron Company, Muncie Division, Muncie
Link-Belt Company, Indianapolis 6
National Mall. & Steel Castings Co., Indianapolis 22

IOWA
Iowa Malleable Iron Co., Fairfield

MASSACHUSETTS
Belcher Malleable Iron Co., Easton

MICHIGAN
Albion Malleable Iron Co., Albion
Auto Specialties Mfg. Co., Saint Joseph
Cadillac Malleable Iron Co., Cadillac
Central Fdry. Div., Gen. Motors, Saginaw

MINNESOTA
Northern Malleable Iron Co., St. Paul 6

MISSISSIPPI
Mississippi Malleable Iron Co., Meridian

NEW HAMPSHIRE
Laconia Malleable Iron Co., Laconia

NEW YORK
Acme Steel & Mall. Iron Works, Buffalo 7
Frazer & Jones Company Division Eastern Malleable Iron Co., Solvay
Oriskany Malleable Iron Co., Inc., Oriskany
Westmoreland Mall. Iron Co., Westmoreland

OHIO
American Malleable Castings Co., Marion
Central Fdry. Div., Gen. Motors, Defiance
Dayton Mall. Iron Co., Ironton Div., Ironton
Dayton Mall. Iron Co., Ohio Mall. Div., Columbus 16
Maumee Malleable Castings Co., Toledo 5
National Mall. and Steel Castings Co., Cleveland 6

PENNSYLVANIA
Buck Iron Company, Inc., Philadelphia 22
Erie Malleable Iron Co., Erie
Lancaster Malleable Castings Co., Lancaster
Lehigh Foundries Company, Easton
Meadville Malleable Iron Co., Meadville
Pennsylvania Malleable Iron Corp., Lancaster

TEXAS
Texas Foundries, Inc., Lufkin

WEST VIRGINIA
West Virginia Mall. Iron Co., Point Pleasant

WISCONSIN
Belle City Malleable Iron Co., Racine
Chain Belt Company, Milwaukee 1
Federal Malleable Company, Inc., West Allis 14
Kirsh Foundry Inc., Beaver Dam
Lakeside Malleable Castings Co., Racine
Milwaukee Malleable & Grey Iron Works, Milwaukee 46

These companies are members of the Malleable Castings Council

For More Facts About Ad on Facing Page Write No. 214→

Products

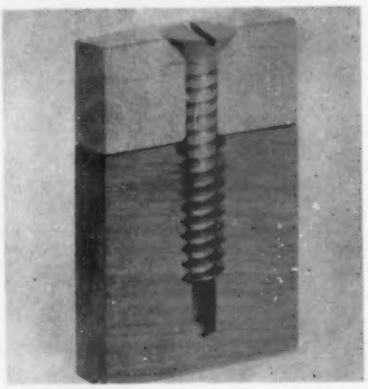
Pillow Block Fits Medium Duty Needs



A low-cost pillow block unit bridges the gap between light duty pressed metal housings and heavy duty cast iron housings. Sturdy, economical pressed steel housings provide a precision bearing-to-housing fit and a true self-aligning bearing. Unit accommodates shaft sizes between ½ and 1-7/16 in. It is suitable for most applications where moderate speeds, moderate radial loads and relatively light thrust loads are encountered, as in fans, idler shafts, conveyors, pump shafts and the like. **The Fafnir Bearing Co., 37 Booth St., New Britain, Conn.**

Write No. 21 on Information Card—Page 32

Wood Fastening System Doubles Holding Power



A self-tapping wire screw thread insert is said to give up to 2½ times the holding power of standard screws. Insert fastener is essentially a tightly-wound coil of carbon steel wire which is inserted into drilled hole for the accommodation of a screw. Increased holding power is attributed to fact that its pitch is half that of standard machine screws. Inserts are available in standard sizes of ¼-10 and 5/16-9, and installation may be accomplished with a variety of hand or power tool equipment **Heli-Coil Corp., Shelter Rock Lane, Danbury, Conn.**

Write No. 22 on Information Card—Page 32

Rugged Steel Tape Made for Outdoor Use



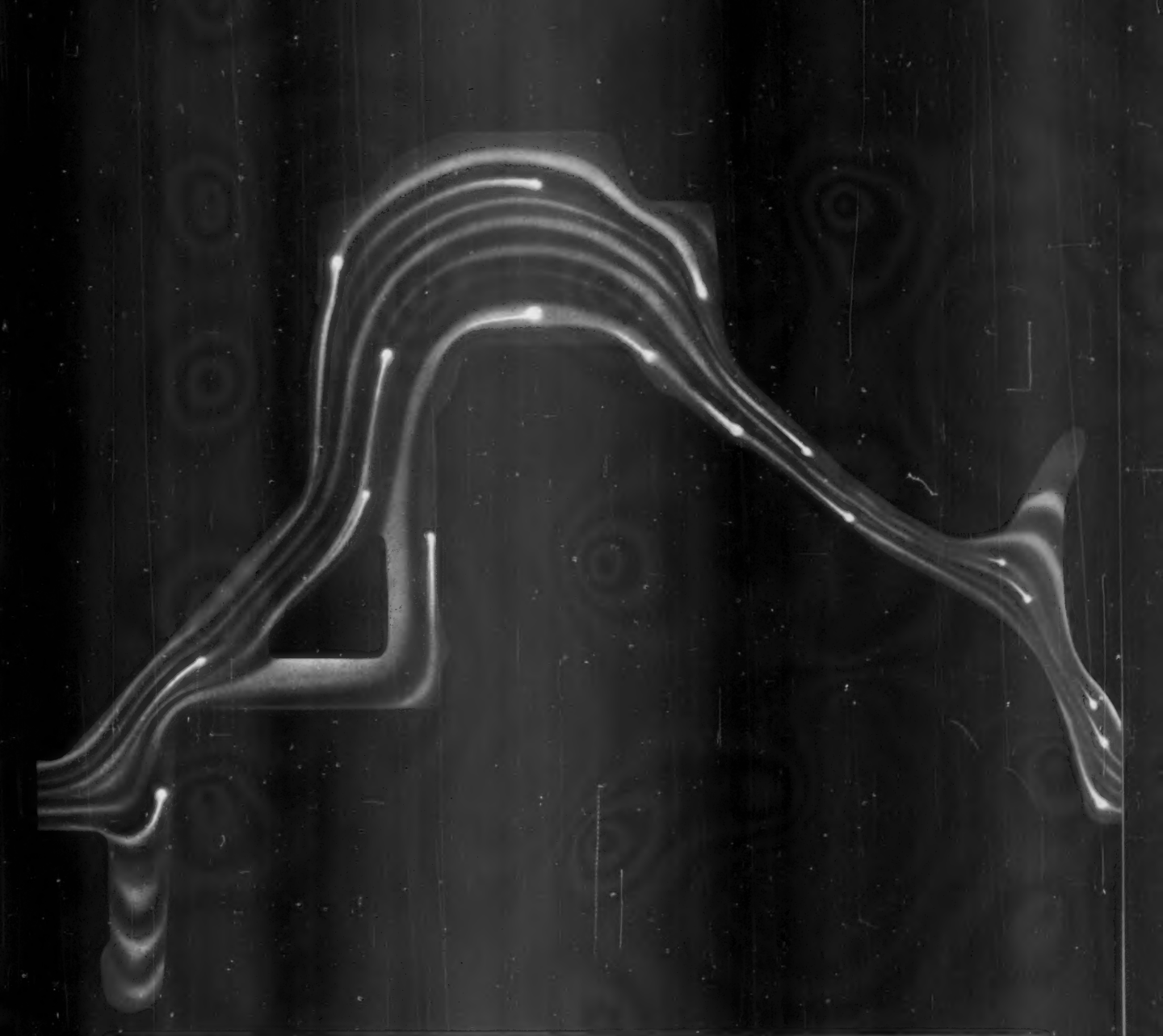
An automatic 50-ft steel tape is engineered for rugged outdoor use. Rewinding is fast and fully automatic. Gears are steel, with hardened pinion and spindle. Spring is unusually long, 146 in., with overriding clutch on hub. White-enameled steel tape is marked in both feet and 16 in. centers. Working parts of mechanism are protected by extra-thick closed aluminum housings. Tape reel is open, so mud and dirt cannot accumulate or clog the action. **Spencer Production & Sales, Pullman, Wash.**

Write No. 23 on Information Card—Page 32

Teflon Coating Covers Wire Cloth Evenly

Teflon coated industrial wire cloth features coating applied so evenly over the entire surface that it will not interfere with mesh openings in mesh sizes as fine as 180 per in. Typical application is in filtration operation where water is present. Teflon coating has tendency to hold water back and allow other liquids to pass through. **Cambridge Wire Cloth Co., Cambridge, Md.**

Write No. 24 on Information Card—Page 32



Liquid flow through a cross section of a Malleable differential carrier.

For Performance-Tested Dependability...Use Malleable

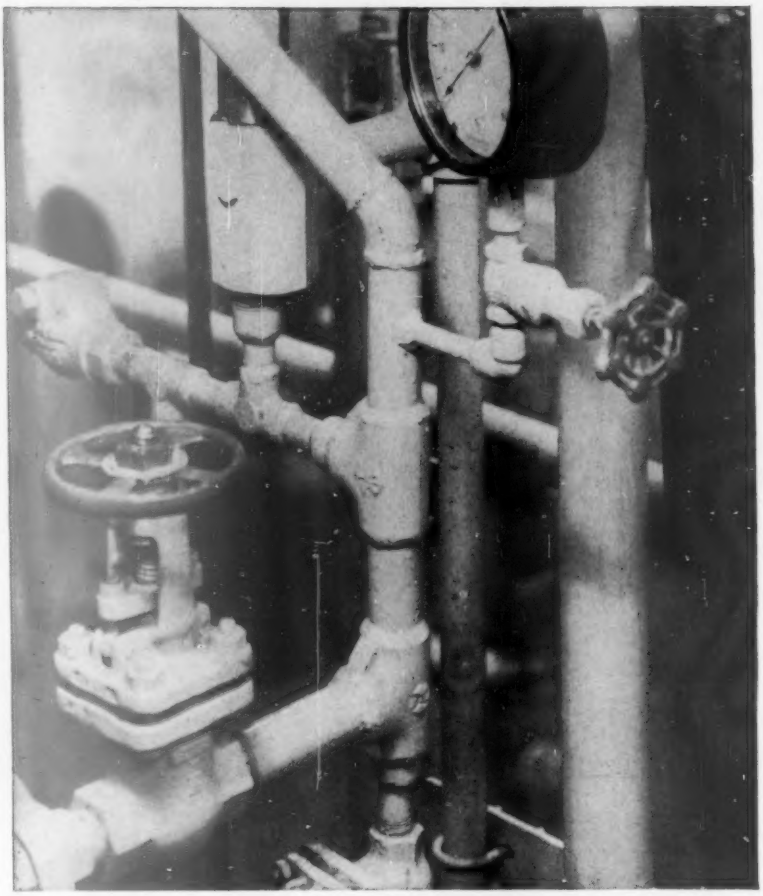
Molten metal flows evenly into all parts of the mold, then solidifies into pre-shaped parts with uniformly dependable properties throughout. Malleable iron castings will stand up under extremes of tension, impact, torsion, shear, fatigue, wear, heat, cold, and corrosion. They also offer maximum economy, are easy to work, and are versatile enough for parts ranging from a few ounces to hundreds of pounds.

The more manufacturers know about Malleable castings, the more they use Malleable to improve quality and increase profits. Get the full story on Malleable ... Contact any of the progressive companies that display this symbol —

MEMBER

MALLEABLE CASTINGS COUNCIL

For details on Malleable's uniformity and reliability contact any company listed on the opposite page, or Malleable Castings Council, Union Commerce Building, Cleveland 14, Ohio.



Forged stainless steel 150 lb. socket weld W-S Fittings on tank piping at E. R. Squibb & Sons plant, New Brunswick, N. J.

To Beat Corrosion's Bite

—W-S FORGED 150 LB. STAINLESS FITTINGS

They're ideal for standard pressure services (300 p.s.i. cold, non-shock and 150 p.s.i. steam pressure) requiring corrosion resistance or toughness at low temperatures.

But maybe your next installations call for forged aluminum fittings, or forged carbon steel fittings, or forged stainless and alloy fittings for higher pressures. W-S specializes in designing and making them all to top standards of safety and high strength . . . with outstanding resistance to shock, heat, vibration.

For specifications and distributor locations, write *Forge & Fittings Division, H. K. Porter Company, Inc., Box 95, Roselle, N. J.*

FORGE AND PORTER FITTINGS DIVISION

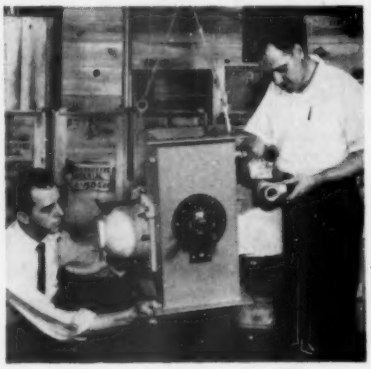
H. K. PORTER COMPANY, INC.

PORTER SERVES INDUSTRY with steel, rubber and friction products, asbestos textiles, high voltage electrical equipment, electrical wire and cable, wiring systems, motors, fans, blowers, specialty alloys, paints, refractories, tools, forgings and pipe fittings, roll formings and stampings, wire rope and strand.

For More Facts Write No. 216 on Information Card—Page 32

Products

Nuclear Gauge Now Measures Solid Materials



Nuclear gauges which are standard equipment for measuring level and density of liquids and slurries can now be used in the measurement of solid materials. A dry solids mass flow density gauge operates as a control for materials in granular form moving through production process, including cement, plastics, foods and minerals—materials whose specific gravity can be determined. Either automatic or operator control of manufacturing process is possible with nuclear gauge. **The Ohmart Corp., 2235 Bogen St. Cincinnati 22, Ohio.**

Write No. 25 on Information Card—Page 32

Pump Connectors Cut Pipeline Vibration



Flexible pump connectors absorb or reduce the troublesome effects of pipeline vibration, misalignment or thermal expansion. Connectors consist of short section of corrugated flexible metal

(*Please turn to page* 110)

For More Facts About Ad on Facing Page Write in No. 217→



No matter how you look at it...

DELTA SERVICE SAVES TIME AND MONEY

Look first in the Yellow Pages—you'll see your Delta Industrial Distributor listed under "TOOLS" or "MACHINERY." He has a real knowledge of Delta Industrial Tools, an understanding of industrial problems, and a desire to serve you in such a way that you'll keep on being a customer.

Here's how he can save you time and money: By helping you select exactly the *right* tools for your production, maintenance, and crating needs from the world's most complete line of metalworking and woodworking tools—at prices competitive with anything in their class. By delivering to you the finest industrial tool values on the market today—Delta quality tools that lower maintenance and operating costs for years to come. And by standing behind the Delta Tools he sells you with prompt and willing service that cuts your downtime and simplifies your parts inventory.

Why not call your Delta Industrial Distributor and let him prove to you how Delta quality—combined with on-the-spot service of equally high quality—can save you time and money?



FOR YOUR FILES—catalog of the world's most complete line of industrial tools—pictures and describes 61 machines, 302 models, over 1400 accessories. For free copy, write: Rockwell Manufacturing Co., Delta Power Tool Division, 728M N. Lexington Ave., Pittsburgh 8, Pa. In Canada: Rockwell Manufacturing Co. of Canada, Ltd., Guelph, Ontario.

DELTA INDUSTRIAL TOOLS

another fine product by

ROCKWELL

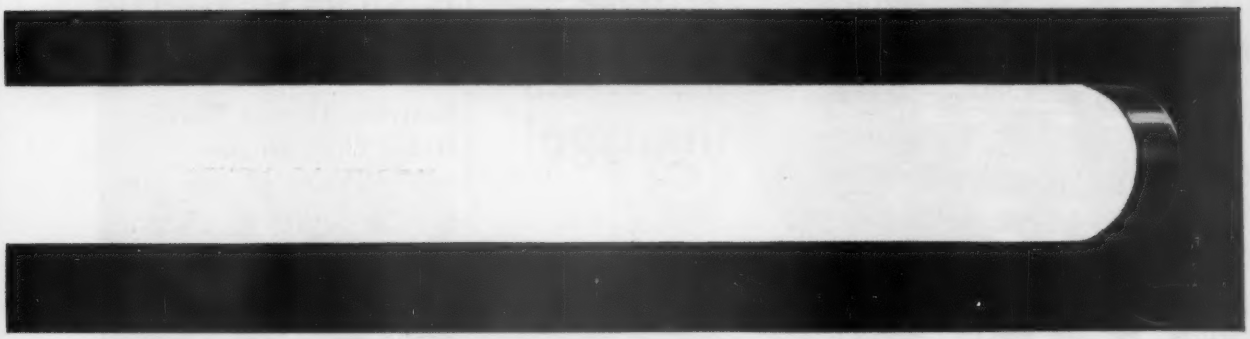
N E



Westinghouse HIGH the brightest 40-watt lamps you

- 3200 lumens output for 40-watt lamps
- 6400 lumens output for 96" Slimline lamps
- No premium cost
- No extra cost for power
- Just snap into your present fixtures

W!



EFFICIENCY Lamps... and slimline fluorescent can buy

Now you can increase the lighting level in your factory, office, warehouse or store without changing a single fixture, without adding to power costs and without paying a premium price for the lamps.

These new High Efficiency Westinghouse Fluorescent Lamps (40-watt Universal and 96" Slimline types) give 15% more light than the cool white and 36% more light than the daylight lamps you now use. They maintain highest levels of light over their long life.

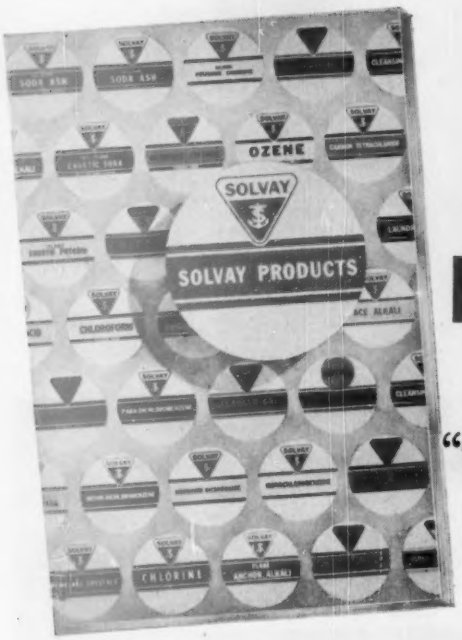
Try High Efficiency Lamps in an entire work area. If you don't agree that you get more light—softer, more comfortable light—we will exchange them for any Westinghouse fluorescent lamps of your choice.

Order new "H.E." lamps today from your authorized Westinghouse Lamp Agent or nearest Westinghouse Lamp Sales Office. You can be sure . . . if it's Westinghouse.

Westinghouse

WESTINGHOUSE LAMP DIVISION
Westinghouse Electric Corporation, Bloomfield, N. J.

For More Facts Write No. 218 on Information Card—Page 32



This CHEMICAL PURCHASING GUIDE "talks" P.A.'s language!

Here . . . in this easy-reading, non-technical guidebook . . . are all the facts you need about Solvay® industrial chemicals before you buy.

You'll find concise information on uses, physical properties, grades, containers, handling. 61 pages of valuable data skillfully indexed to help you quickly locate any product in the extensive Solvay line . . . soda ash, caustic soda, chlorine, special alkalies, ammonium and potassium products, hydrogen peroxide, chloromethanes, chlorobenzenes, calcium chloride, chromium chemicals.

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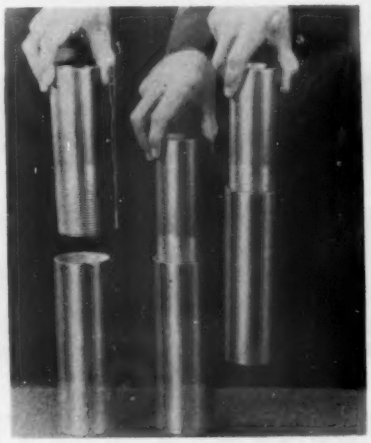
Products

(*Continued from page 106*)

tubing, protected against pressure elongation by wire braid. They are furnished with threaded or flanged end connections to fit all standard piping sizes and are available from ¼ through 16 in. in stainless steel, ¼ through 6 in. in bronze and hot-dip-galvanized steel, and ¼ through 4 in. in monel. They handle pressures to 1500 psig, depending on alloy and size. **Allied Metal Hose Co., 8-14 38th Ave., Long Island City 1, N. Y.**

Write No. 26 on Information Card—Page 32

Buttress Thread Tubing Helps Oil Industry



A non-upset tubing joint offers major advantages for the oil industry in its effort to attain deeper well depths. Buttress thread design is applied to plain end, non-upset tubing. Pipe and couplings can be stabbed together on normal drop impact without thread damage or cross-threading. Maximum well clearance is provided, with full inside diameter assuring maximum flow. Pipe-coupling joints can be made up and broken a minimum of 12 times without thread damage. Joint strength is about 98% of pipe body strength. Buttress threads are tin plated for maximum protection against leakage, designed for pressures up to 15,000 psi. **National Tube Div., United States Steel Corp., 525 William Penn Place, Pittsburgh 30, Pa.**

Write No. 27 on Information Card—Page 32



SLICE THROUGH THE TOUGHEST METALS

ALLOY STEELS . . . DIE STEELS . . . STAINLESS STEELS . . .

all are efficiently cut with Barnes Power Blades

BARNES produces four outstanding power blades:

BARNES-WELD • ROCKET • SERVICE • RED ARROW

The quality in all Barnes blades gives you the lowest possible cost per cut.

Your nearby Barnes Distributor will give you facts on the Barnes blade best qualified for your needs. If required, he will call in the Barnes Sales Engineer for consultation.

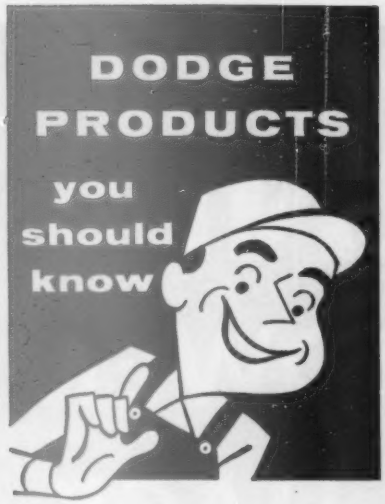
It pays to do business with your Barnes Distributor . . . he is reliable, gives you fast service, simplifies your ordering and reduces your inventory.

W. O. BARNES CO., INC.

1297 Terminal Avenue **Detroit 14, Michigan**

Barnes-Distributor teamwork means quality products . . . available locally at lowest possible cost.

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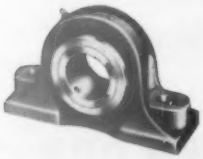




FLEXIDYNE
THE DRY FLUID DRIVE
New soft starts — overload protection



TAPER-LOCK
CHAIN COUPLINGS
No reboring — no waiting!



SC, SCM BALL BEARING
PILLOW BLOCKS
Quality, for normal and medium duty!

Write for Bulletins!

- Flexidyne Drives & Couplings.
- Chain Couplings and Sprockets.
- Bearings — Ball and Roller.

DODGE MANUFACTURING CORPORATION
1300 Union Street • Mishawaka, Indiana

DODGE
of Mishawaka, Ind.

For More Facts Write No. 221
on Information Card—Page 32

Products

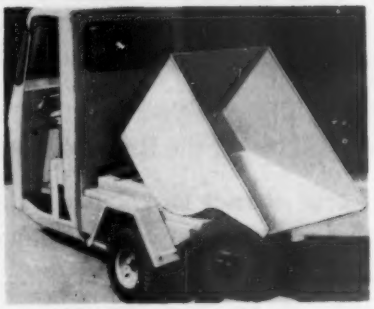
Floor Topping Gives Tough, Dense Surface



A dimensionally stable thermosetting plastic floor topping bonds firmly and completely to concrete, metal and wood, forming a dense, impermeable surface and withstanding wet heat up to 212 F. Topping has four times the tensile and compressive strength of concrete and ten times its flexibility. It is recommended for such applications as bottling plants, canneries, chemical plants and laboratories. Topping has exceptional adhesive qualities and toughness, resisting most acids, alkalis, oils, greases, and detergents as well as thermal shock and moisture. **Monroe Co., Inc., 10703 Quebec Ave., Cleveland 6, Ohio.**

Write No. 28 on Information Card—Page 32

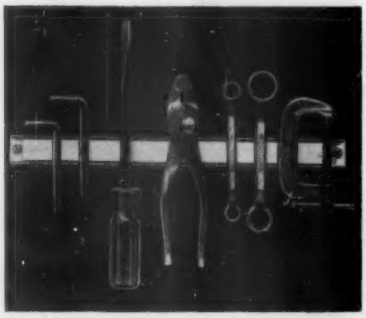
Truckster Provides Low-Cost Dumping



A truckster with an 11 cu ft dump hopper is intended for such light applications as trash collection, light construction hauling and the like. Hopper empties by gravity and will carry an 800 lb payload. Truckster is powered by 7.95 hp 4-cycle high compression engine and deliveries 50 mi per gallon. Its wheel-base is 72 in., overall width is 48 in. and overall length 102 in. It has brakes on all three wheels and an independently operated parking brake. Cab is fibre glass and steel; dump hopper is of 12 gauge cold rolled steel and is welded water tight. **Cushman Motors, Lincoln, Neb.**

Write No. 29 on Information Card—Page 32

Magnetic Holder Keeps Tools Handy

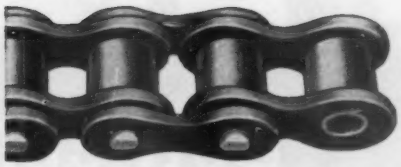


An all-purpose magnetic tool holder keeps hand tools within easy reach. For use in machine shops, mills, factories, etc., unit holds tools of normal size and weight neatly in position. Unusually large or heavy tools can be accommodated by two or more units placed together. Tool holder is 1 in. wide and 12 in. long. It is supplied either with screw holes for mounting on walls and wooden benches, or with magnetized back for attaching directly to machines, partitions or other metal surfaces. **Magnetic Products Div., Jess Corp., 15770 Telegraph Rd., Detroit 39, Mich.**

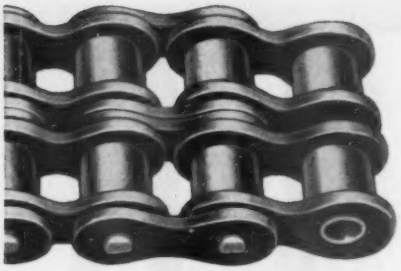
Write No. 30 on Information Card—Page 32



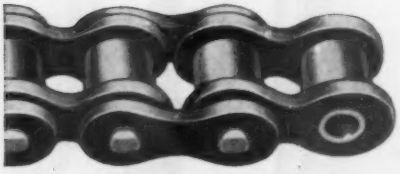
"It's for you."



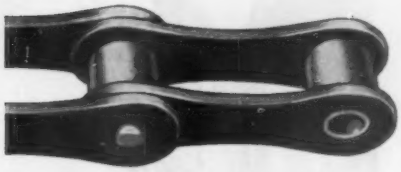
SINGLE STRAND



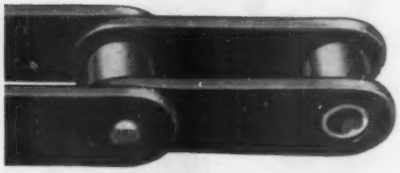
DOUBLE STRAND



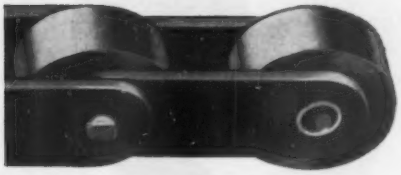
SINGLE STRAND, HEAVY SERIES



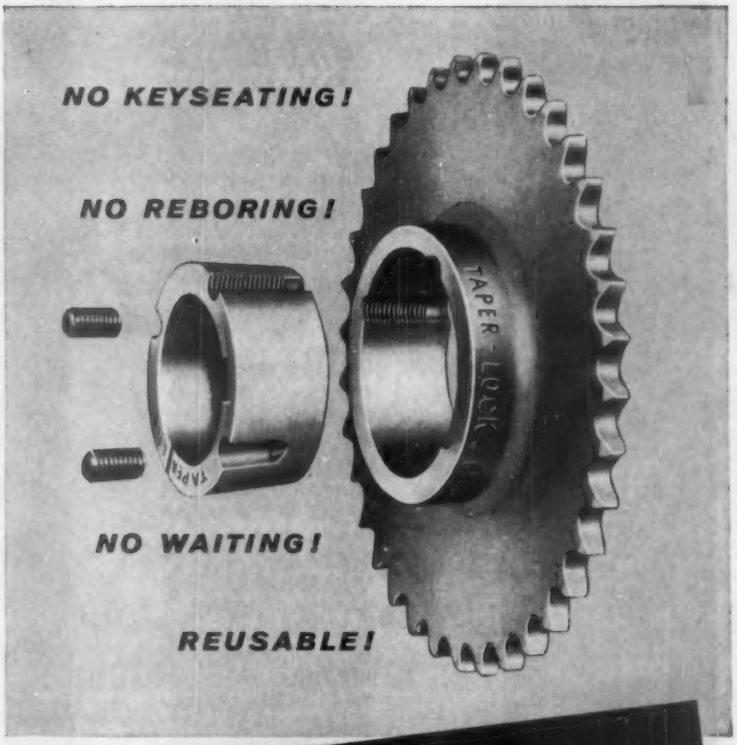
DOUBLE PITCH TRANSMISSION



DOUBLE PITCH CONVEYOR



DOUBLE PITCH CONVEYOR, LARGE ROLLERS



TAPER-LOCK SPROCKETS DODGE ROLLER CHAIN

DODGE Quality Roller Chain, teamed with Dodge Taper-Lock Sprockets, results in chain drives and chain conveyors that have the precision, efficiency and stamina necessary for the real economy of *long life*.

Moreover, Taper-Lock's reusable bushing makes a difference in overall cost. The ease of Taper-Lock mounting, the elimination of reboring, keyseating, and wasted time, add to the saving. Precision machining and true articulation lengthen the life of *both* sprocket and chain.

The Dodge line of chain, including standard attachments, is extensive. It meets a high percentage of all chain requirements.

In the Double Pitch series (both Transmission and Conveyor) the sizes which require special spacing for perfect tooth action are offered from stock in special double pitch design — to double the life of the chain and the sprocket!

Ask your local Dodge Distributor. Or write us for bulletin.

DODGE MANUFACTURING CORPORATION, 1300 Union St., Mishawaka, Ind.

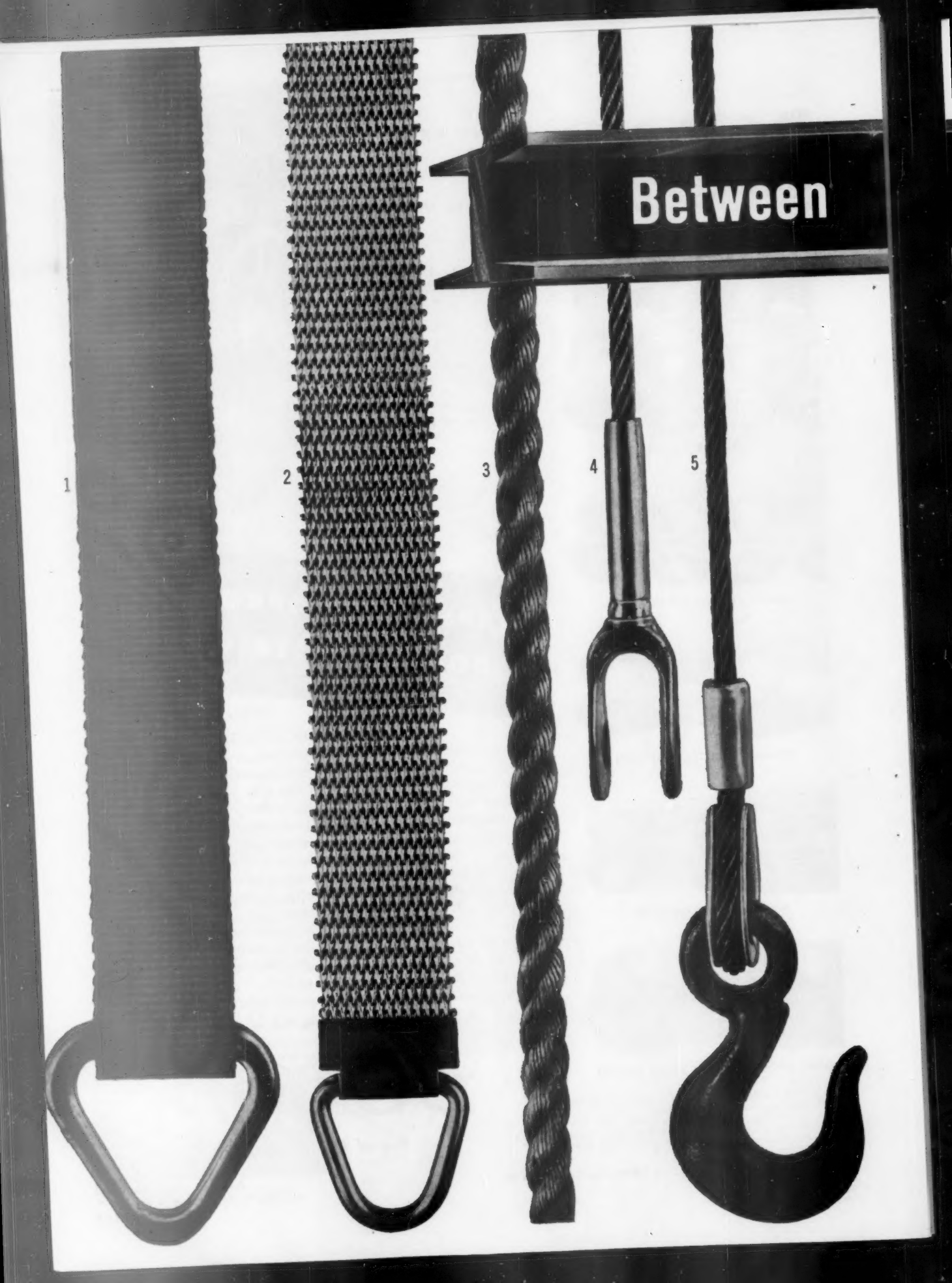


CALL THE TRANSMISSIONEER—your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look under "Dodge Transmissioneer" in the *white* pages of your telephone directory, or in the yellow pages under "Power Transmission Machinery."

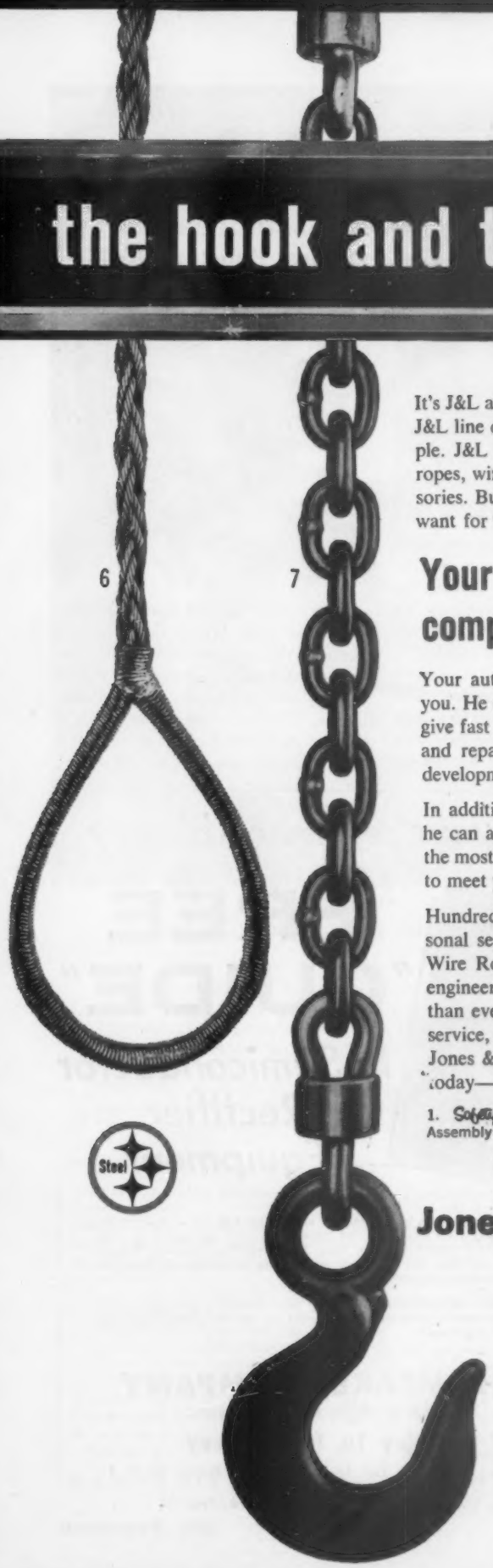
DODGE
of Mishawaka, Ind.

For More Facts Write No. 222 on Information Card—Page 32

For More Facts About Ad on Following Page Write in No. 215→


Between
1
2
3
4
5

the hook and the load...



It's J&L all the way between the hook and the load, because the complete J&L line covers every lifting need. The illustrations here are only a sample. J&L hand and power hoists are not shown. Nor many other wire ropes, wire rope slings, alloy chain slings, fittings, assemblies and accessories. But, illustrated or not, you'll find in the J&L line everything you want for all your lifting jobs.

Your J&L industrial distributor has the complete lifting line for complete safety

Your authorized J&L Wire Rope Distributor is fully equipped to help you. He can provide you with any item from this complete line and can give fast service, too—right down to securing *while-you-wait* fabrication and repair of alloy chain slings with JalLink (another exclusive J&L development).

In addition, if you are faced with an unusually tough lifting operation, he can arrange for skilled J&L engineers to help you. They'll advise on the most suitable method—or even design a lifting mechanism specifically to meet your problem.

Hundreds of J&L Distributors give you all the advantages of local, personal service, *plus* the delivery back-up of 15 strategically placed J&L Wire Rope Service Centers, *plus* the applications help of J&L factory engineers. When you select from the complete J&L line, you get more than everything you need between the hook and the load. You also get service, safety and confidence in lifting—because it's J&L. Call your Jones & Laughlin Wire Rope Service Center or Wire Rope Distributor today—they're listed in the yellow pages.

1. Safety-Weave Nylon Sling. 2. Woven Wire Belting. 3. Manila Cordage. 4. Swaged Assembly with Fork Eye. 5. JalKlamp Bridle Sling. 6. Braided Sling. 7. Alloy Chain Sling.

FOR SAFETY IN LIFTING

Jones & Laughlin Steel Corporation

WIRE ROPE DIVISION · Muncy, Pennsylvania

WIRE ROPE

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Phone your Airco Distributor...

For oxygen, nitrogen, hydrogen, standard nitrogen-hydrogen mixtures (where available), argon, helium and standard argon-helium mixtures

Are you making or repairing construction or farm equipment, automotive bodies, office equipment, air conditioners, building panels, freezers, trailers or any of a hundred other fabricated products with oxyacetylene welding, Heliwelding or Aircomatic® welding? Or are you involved in scrapping or other cutting operations? Your authorized Airco Distributor is your local supply source for the super-pure gases that you need. And when you want that gas *fast*—your Airco Distributor can't be beat for prompt service.

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Products

Stock Selecting Tractor Steers Itself



A stock selecting tractor with speeds up to 6 mph provides increased automation in order selection. Tractor steers itself by using sensing device to follow an energized guide wire embedded in the floor. Order picker is free to work at top speed, starting and stopping tractor by pushing a button on a small radio transmitter attached to his belt. Guidance along the route is automatic. **Barrett-Cravens Co., 628 Dundee Rd., Northbrook, Ill.**

Write No. 31 on Information Card—Page 32

Armor-Plate Makes Tire Almost Puncture-Proof



An armor-plated pneumatic industrial tire is invulnerable to practically all puncturing objects encountered in scrap yards and on debris-littered construction sites. Tire has two plies of steel cables embedded in rubber beneath

(*Please turn to page* 118)

for your reference library



FREE "GUIDE"

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Complete technical data—fully illustrated...all you need to know about Semiconductor Rectifier Equipment for *any* industrial power conversion application in your plant. Battery chargers; D.C. Power Supplies, Mag Amp Regulated; Massive Current Limiting Rectifiers used with D.C. Arc Furnaces; to complete Semiconductor Rectification Systems for the operation of electrolytic cells.

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SINCE MEAKER 1899

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For More Facts Write No. 224 on Information Card—Page 32



Important New Book for Anyone Interested in Material Specifications

Contains 68 pages of engineering facts about Meehanite®.

This technical book has been prepared for designers, engineers and purchasing executives who strive to improve product performance and reduce manufacturing costs. It presents the physical properties of each of the 26 types of Meehanite metal available and is jam-packed with data that makes it easier for the materials engineer to evaluate and specify the most suitable metal for his casting application. Included are heat treatment and machining data and numerous photographs of typical applications. For your free single copy see one of the Meehanite foundries listed below or write *Meehanite Metal Corporation, 714 North Avenue, New Rochelle, New York.*

MEEHANITE METAL

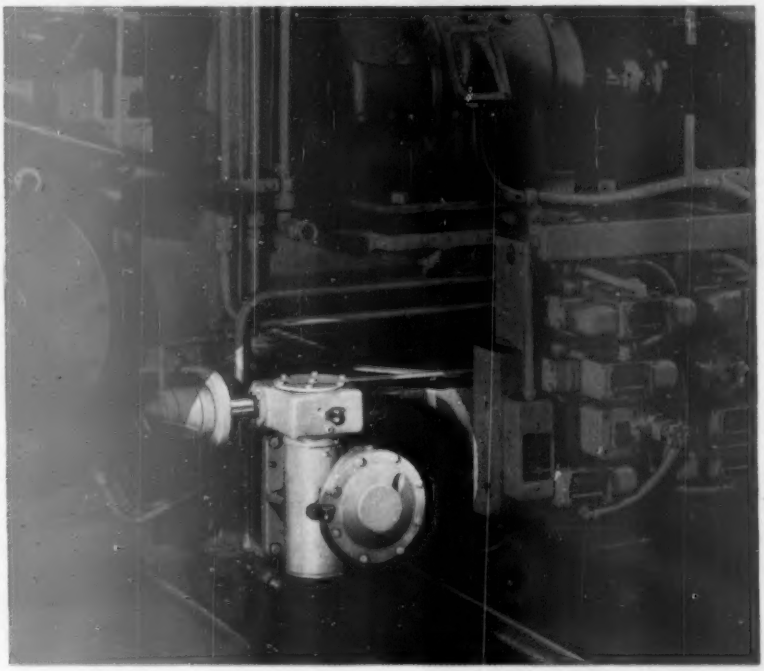
The American Laundry Machinery Co., Rochester, N. Y.
Atlas Foundry Co., Detroit, Mich.
Banner Iron Works, St. Louis, Mo.
Barnett Foundry & Machine Co., Irvington, N. J.
Casting Service Corp., LaPorte, Indiana and Bridgman, Michigan
Centrifugally Cast Products Div., The Shenango Furnace Co., Dover, Ohio
Crawford & Doherty Foundry Co., Portland, Ore.
Dayton Casting Co., Dayton, Ohio
Empire Foundry Co., Tulsa, Okla.
Florence Pipe Foundry & Machine Co., Florence, N. J.
Fulton Foundry & Machines Co., Inc., Cleveland, Ohio
General Foundry & Mfg., Flint, Mich.
Georgia Iron Works, Augusta, Ga.
Greenlee Foundries, Inc., Chicago, Ill.
Hamilton Foundry Inc., Hamilton, Ohio
Johnstone Foundries, Inc., Grove City, Pa.
Kanawha Manufacturing Co., Charleston, W. Va.
Kennedy Van Saun Mfg. & Eng. Corp., Danville, Pa.
Lincoln Foundry Corp., Los Angeles, Calif.
Love Brothers — Pyott Foundry & Machine Div. Mueller Ind. Inc., Aurora, Ill.
Oil City Iron Works, Corsicana, Texas
Palmyra Foundry Co., Inc., Palmyra, N. J.
The Henry Perkins Co., Bridgewater, Mass.
Pohlman Foundry Co., Inc., Buffalo, N. Y.
Rosedale Foundry & Machine Co., Pittsburgh, Pa.
Ross-Meehan Foundries, Chattanooga, Tenn.
Sonith Foundries of FMC, Indianapolis, Ind.
Standard Foundry Co., Worcester, Mass.
The Stearns-Roger Mfg. Co., Denver, Colo.
Vulcan Foundry Co., Oakland, Calif.
Washington Iron Works, Seattle, Wash.
Dorr-Oliver-Long, Ltd., Orillia, Ontario
Hartley Foundry Div., London Concrete Machinery Co., Ltd., Brantford, Ontario
Otis Elevator Co., Ltd., Hamilton, Ontario

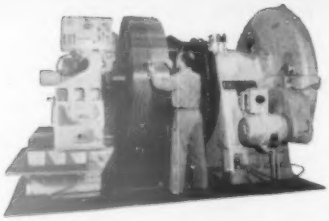
MEEHANITE METAL CORPORATION, NEW ROCHELLE, NEW YORK

For More Facts Write No. 225 on Information Card—Page 32

FARREL-BIRMINGHAM SELECTS WINSMITH

for compactness, heavy duty construction, ease of service





Farrel Model 10-T can cut gears having a max. pitch dia. of 120″ with a 24″ face. The generating feed mechanism is controlled by a hydraulic drive through a Winsmith Model 7 CVD Double Reduction Worm Gear Speed Reducer—ratio 120:1—providing maximum flexibility and a wide feed range.

Farrel Gear Generators—manufactured by Farrel-Birmingham—are machines of unusual accuracy and versatility. They are used for mass production, general jobbing and tool room work. Their speed, precision and convenience of operation increase output and decrease costs of generating gears of all types.

Farrel-Birmingham selected Winsmith Worm Gear Speed Reducers because of their compactness, precise heavy duty construction, their ease of maintenance and parts availability. These add up to maximum service—minimum maintenance and downtime.

WINSMITH SPEED REDUCERS

WRITE TODAY for complete selection information and engineering data on the hundreds of Winsmith types and sizes. For every application—from 1/100 to 85 hp., in ratios from 1.1:1 to 50,000:1—you'll find it pays to standardize on Winsmith.

MEMBER OF AGMA

WINSMITH, INC.

18 Sixth Street, Springville, (Erie County), N. Y.

For More Facts Write No. 226 on Information Card—Page 32

Products

(*Continued from page* 116)

the tread. When given the severest on-the-job testing, tire is reported to have outlasted standard industrial tires six to one and reduced punctures as much as five to one. **B. F. Goodrich Co., Akron, Ohio.**

Write No. 32 on Information Card—Page 32

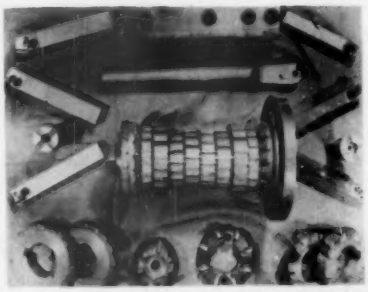
Flexible Welding Torch Adjusts to Any Angle



A controlled angle welding torch has a flexible body which can be readily hand-adjusted to any angle as well as extended to reach into difficult recesses. For use in tungsten inert gas arc welding, torch serves as substitute for many torches of varying head angles, styles and sizes. Other advantages include: better and faster welding, low maintenance, and less welder fatigue. **Falstrom Co., 147 Falstrom Ct., Passaic, N. J.**

Write No. 33 on Information Card—Page 33

Powdered Metal Tools Last 4 to 5 Times Longer



Cutting tools made of copper infiltrated powdered iron are expected to have four or five times

(*Please turn to page* 122)

BUSINESS IN MOTION

To our Colleagues in American Business . . .

It has often been mentioned in these messages that in order to produce the best possible product at the least possible cost, it is a good idea to take your suppliers into your confidence . . . tell them your problems . . . seek their aid.

The following incident is a striking example of the advisability of doing just that.



The Dayton Precision Manufacturing Company, maker of the commutator you see illustrated, was having difficulties with the ferrous metal it was using for the hub; for not only did the rod from which the hubs were fabricated have to be drilled but it also had to be able to withstand a flanging operation. Their Chief Engineer decided to discuss this with one of Revere's Technical Advisors.

After a thorough study of the problem Revere Brass Rod of a certain alloy was recommended and samples were furnished. The manufacturer found the machinability of the brass rod to be outstanding, being readily and speedily drilled. Also, it withstood the flanging operation . . . a set of manufacturing conditions where only brass, the right kind of brass, outshines all other metals and alloys.

The final score showed that the low first cost of the brass rod, plus the fact that it could be machined faster and more easily than ferrous metal, resulted in a superior product at a saving in production cost. A further advantage was the added sales appeal of the brass hub.

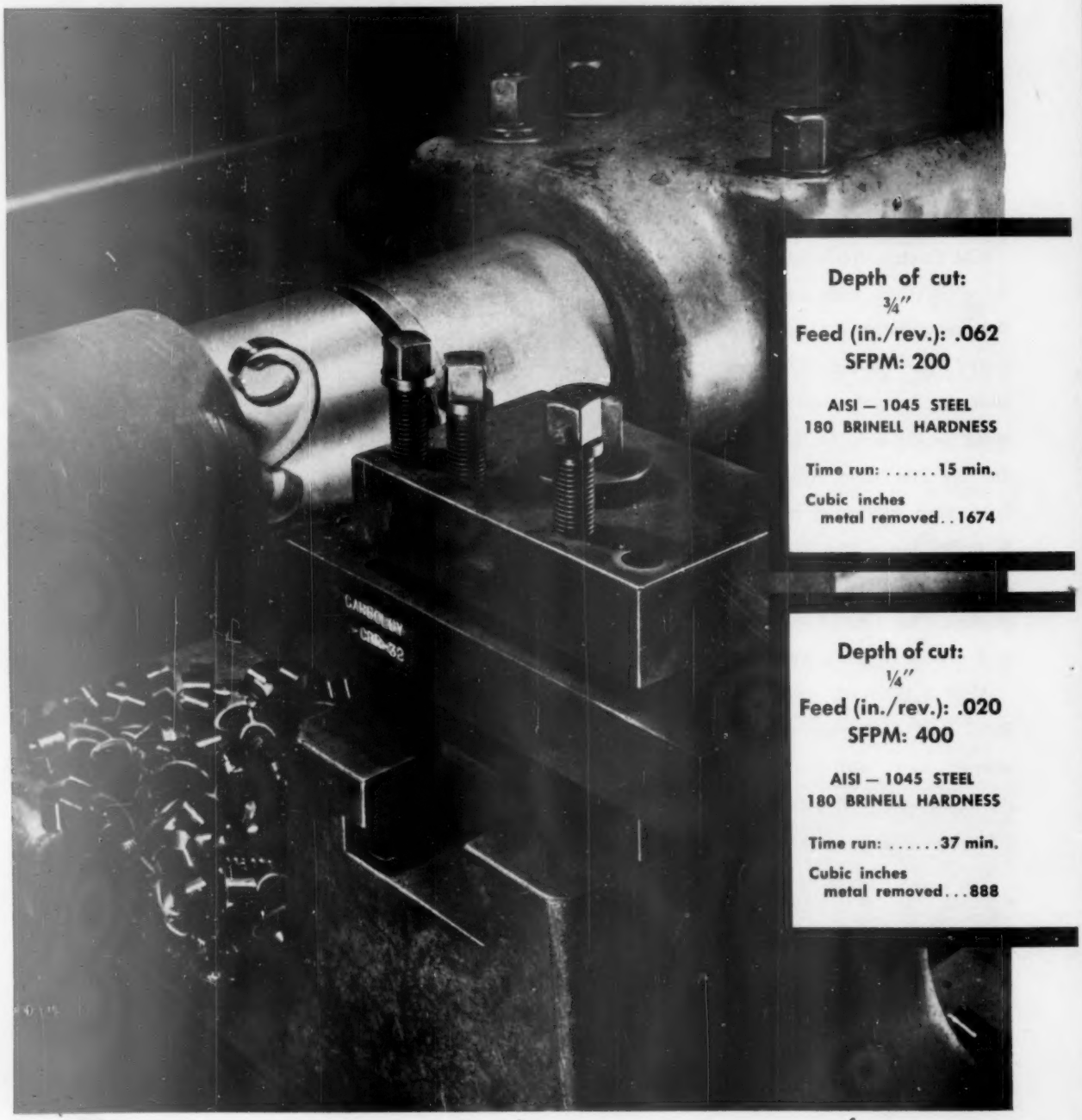
There you have another example of how Revere in collaboration with the manufacturer's engineering department, helped "fit the metal to the job," which resulted in a better part at the least possible cost.

Revere, a supplier, is conscious that still other suppliers can often collaborate to help customers produce a superior product for less money.

And because almost every industry you can name is able to cite similar instances, we suggest that no matter what your suppliers ship you, it may pay you to take them into your confidence.

REVERE COPPER AND BRASS INCORPORATED
Founded by Paul Revere in 1801
Executive Offices: 230 Park Avenue, New York 17, N. Y.
Distributors Everywhere

Why ?



Depth of cut:
¾"
Feed (in./rev.): .062
SFPM: 200

AISI — 1045 STEEL
180 BRINELL HARDNESS

Time run: .....15 min.

Cubic inches
metal removed..1674

Depth of cut:
¼"
Feed (in./rev.): .020
SFPM: 400

AISI — 1045 STEEL
180 BRINELL HARDNESS

Time run: .....37 min.

Cubic inches
metal removed...888

Why is one Carboloy carbide grade best for light-duty steel-cutting applications; another more suitable for heavy-duty jobs? And which should you use?

Carbide selection can be scientific (and *should* be!) if you are going to get optimum results from your steel-cutting operation.

Take the job-graded Carboloy Grades 78B* and 370, for example. The 78B Grade is designed to offer real economy in normal steel-cutting applications—where machine power is limited. The 370 Grade, on the other hand, was developed specifically for heavy-duty steel-cutting jobs. Look over the following examples; then contact your Carboloy representative, or Authorized Carboloy Distributor, for information on Carboloy *job-graded* carbides for your specific operation. Take advantage of *better profits through better tooling.* Call today, or write: *Metallurgical Products Department of General Electric Company, 11143 E. 8 Mile Street, Detroit 32, Michigan.*

*Carbides in 78 Series are all pre-honed. Carbides in the 300 series are available pre-honed, precision-ground, or utility-ground.

HEAVY-DUTY MACHINING

Photograph A shows the Carboloy 370 Grade insert after the run. Wear land was only .012", and there is no deformation (upsetting) of the cutting edge. Photo B shows the 78B Grade insert after the same run. Note the deformation of the cutting edge . . . Grade 78B was not designed for such severe cutting pressures.

CONCLUSION: *In this heavy-duty application, Carboloy 370 Grade is recommended.*



LIGHT-DUTY MACHINING

In this light-roughing application there is little visible difference between the Carboloy 78B Grade insert (Photo A) and the 370 Grade insert (Photo B). Because 78B Grade is job-graded for light- and medium-roughing applications, it will wear as long as 370 Grade. Grade 78B insert is lower in initial cost, so in this case it makes good sense to use Grade 78B. In this example, the wear land on 78B insert was only .010".

CONCLUSION: *In this normal steel-cutting application, Carboloy 78B Grade is recommended.*



CARBOLOY® CEMENTED CARBIDES

METALLURGICAL PRODUCTS DEPARTMENT

GENERAL ELECTRIC

CARBOLOY® CEMENTED CARBIDES • MAN-MADE DIAMONDS • MAGNETIC MATERIALS • THERMISTORS • THYRITE® • VACUUM-MELTED ALLOYS

For More Facts Write No. 228 on Information Card—Page 32

NOW... STOCK SPIRAL BEVEL GEARS TO CUT COSTS

Now for the first time Perkins offers a complete line of stock spiral bevel gears with precision quality to help you get maximum savings in tooling expense and gear cost. When you're planning for spiral bevel gears, design your requirements around this Perkins stock line . . . it can pay you well.



Perkins stock spiral bevel gears have soft bores and may be reworked to a maximum diameter. The gears are matched in pairs and lapped together after hardening for smooth running. In many cases these gears are available in left and right hand drives. This new line of stock gears includes the most commonly used ratios and sizes proportioned according to the Gleason Spiral Bevel Gear System.



AVAILABLE ON REQUEST:

This new folder includes all standard specifications of Perkins complete line of stock spiral bevel gears. Write for folder No. 7G.

PERKINS
MACHINE AND GEAR CO.
WEST SPRINGFIELD, MASS., U.S.A.

For More Facts Write No. 229 on Information Card—Page 32

Products

(*Continued from page* 118)

longer life than conventional tools. Grain structure absorbs vibrations which normally cause premature deterioration. In addition, infiltrated copper conducts heat from cutting edge, thus prolonging its effective life. Rate of metal removal can be increased substantially and closer tolerances and improved finishes achieved. Throw-away carbide, ceramic and cermet inserts are available for the new tools. **Ferro Powdered Metals, Inc., Salem, Ind.**

Write No. 34 on Information Card—Page 32

Wired Glazing Panels Resist Impact, Cut Glare



A translucent press-molded protective panel with expanded metal embedded in fiberglass provides exceptional strength and unique decorative effects for industrial glazing applications, in windows, partitions, skylights, etc. Protective panels offer high impact resistance and maximum light transmission without undesirable glare. Panels come in a variety of attractive colors. **Chemold Co., 2000 Colorado Ave., Santa Monica, Calif.**

Write No. 35 on Information Card—Page 32

Plastic Wire Grommet Snap-locks in Place

Wire, cable or tubing can be insulated and supported from a mounting panel, chassis, wall, housing or similar surface with a snap-lock plastic grommet. Grommet is inserted in panel hole and snapped together. It locks in place

(*Please turn to page* 124)

For More Facts About Ad on Facing Page Write in No. 230→



an education in itself—

"The gleam of Stainless Steel"

displayed at your favorite store

As one in the metals fabricating business—whether design, production or purchasing—you'll have a special interest in the stainless products for the home now featured at your leading store. The eye-opening promotion of variety, beauty and utility in stainless home products today is doubly impressive to the man who sees the technical accomplishments behind the glamor. • Many of the pieces will have been crafted from SUPERIOR Stainless Strip Steel—chosen for uniform highest quality in every coil. Specify it safely for your strictest demand.

Superior

STAINLESS STRIP STEEL

SUPERIOR STEEL DIVISION

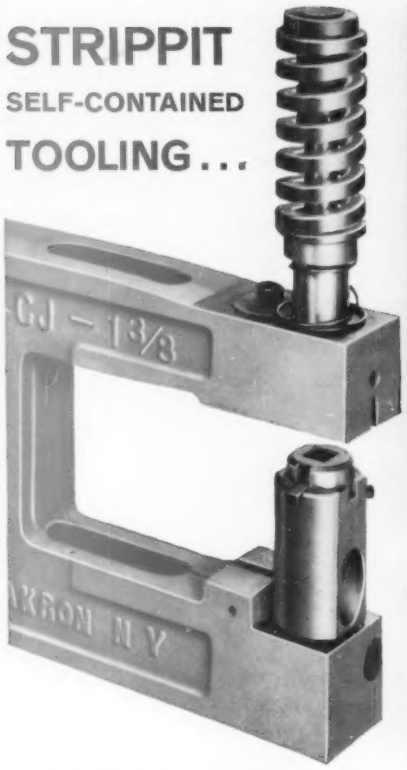
OF

COPPERWELD STEEL COMPANY

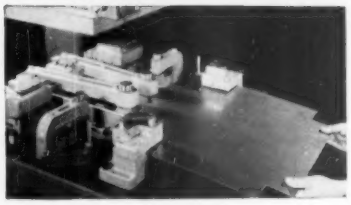
CARNEGIE, PENNSYLVANIA

For Export: Copperweld Steel International Company, New York

STRIPPIT
SELF-CONTAINED
TOOLING...



cuts costs 10 ways



1. ***no expensive custom dies***—save all the time and cost involved in designing and building custom, single-purpose dies.
2. ***lower labor costs***—no high-salaried tool and die makers are needed. Any good bench man can set up Strippit Tooling.
3. ***minimum tool investment***—Strippit units can be kept in continuous use. You have no heavy investment in idle dies—no die storage problem.
4. ***shorter lead time***—as soon as the pattern is ok'd, Strippit Tooling can be set up and put into production *immediately*.
5. ***faster, more accurate setups***—Strippit units are self-contained, self-stripping and permanently aligned—bench-assembled on drilled templates, T-slotted plates or bed rails. Nothing is attached to the press ram. No need for die spotting and setting.
6. ***press downtime cut***—as each run is completed a new Strippit setup is already waiting for the press. Self-contained design permits punch replacement in the press. Downtime is kept to a minimum.
7. ***unlimited versatility***—Strippit units can be set up in any hole pattern and used over and over again—for long press runs or quick-change pilot runs—in stamping presses or press brakes.
8. ***a complete line from a single source***—punching units with standard or special tooling, for punching up to 3/4" mild steel—standard and special notching units for work up to 1/4" mild steel.
9. ***nationwide sales and service***—by trained tooling methods engineers in all major industrial areas. Manufacturing plants in Akron, N.Y., Los Angeles, Calif.; warehouse in Chicago, Ill.
10. ***specify "Strippit"***—the original system of self-contained tooling. There are imitations but no substitute for Strippit engineering know-how, tested and proved designs and materials, first-class workmanship and the other advantages of doing business with a reputable organization that has been in business for 35 years.

FOR COMPLETE INFORMATION—write for the new Strippit General Catalog.

WALES **STRIPPIT** INC.
229 Buell Road • Akron, New York
In Canada: Strippit Tool & Machine Company, Brampton, Ontario

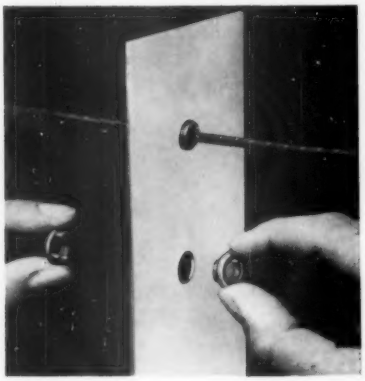
A UNIT OF HOUDAILLE INDUSTRIES, INC.

For More Facts Write No. 231 on Information Card—Page 32

Products

(*Continued from page 122*)

and provides a rigid bearing surface, greater dielectric, extreme chemical and wear resistance.



Identical halves form a complete grommet, thus eliminating separate handling. Three sizes: 3/16 in. hole diameter, 1/4 in., and 3/8 in. Panel hole required is 1/8 in. larger than wire hole diameter. Molds for special sizes upon application. **Budwig Mfg. Co., P. O. Box 4212, Glendale 2, Calif.**

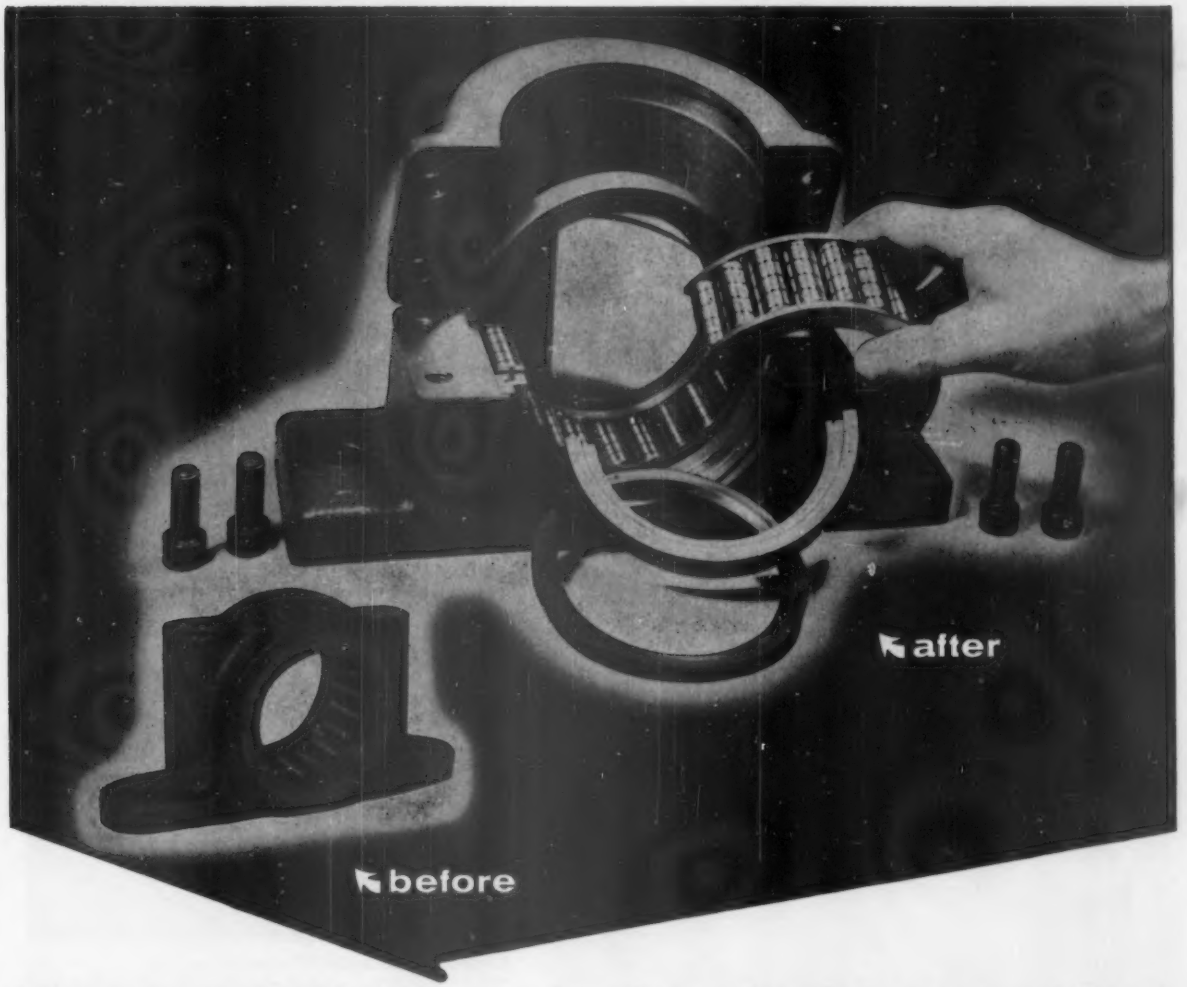
Write No. 36 on Information Card—Page 32

Clamp Holds Two Pipes at Right Angles



A simple fastening device requires only one manual adjustment to hold two pipes or tubes of different diameters firmly together at right angles. Device adjusts to pipe diameter in any given application, which includes: temporary plumbing, light scaffolding, experimental fixtures, drying racks, etc. Models are available for fluid-carrying pipes which eliminate the need for holes in pipe. **Hunter Spring Co., Div. of American Machine & Metals, Inc., Lansdale, Pa.**

Write No. 37 on Information Card—Page 32



Here's a "before" and "after" bearing problem solved by Bearings, Inc.

A large steel mill customer has six cranes with bridge line shafts equipped with the solid housing pillow blocks shown in the "before" photograph. Whenever one of the line shaft bearings needed to be replaced, the entire section of shaft had to be removed. Maintenance costs and crane downtime were excessive and costly. Our engineers were asked for a solution.

THE PROBLEM: Due to the extremely low base to center of shaft dimension of the original bearing, a conventional split housing, split roller bearing pillow block could not be used.

THE ANSWER: We designed and furnished a special split housing pillow block (see "after" photo) incorporating split bearings and split seals which maintain the original dimensions. These can be installed or replaced on the crane in a fraction of the time formerly required just to dismantle the line shaft.

This is just one of many successful solutions of a tough bearing problem. We can help you solve your bearing problems and supply replacement bearings from the stock carrying branch near you. We're authorized distributors for all nationally known bearings. Call us!

Providing bearing service in the North → **BEARINGS, INC.**

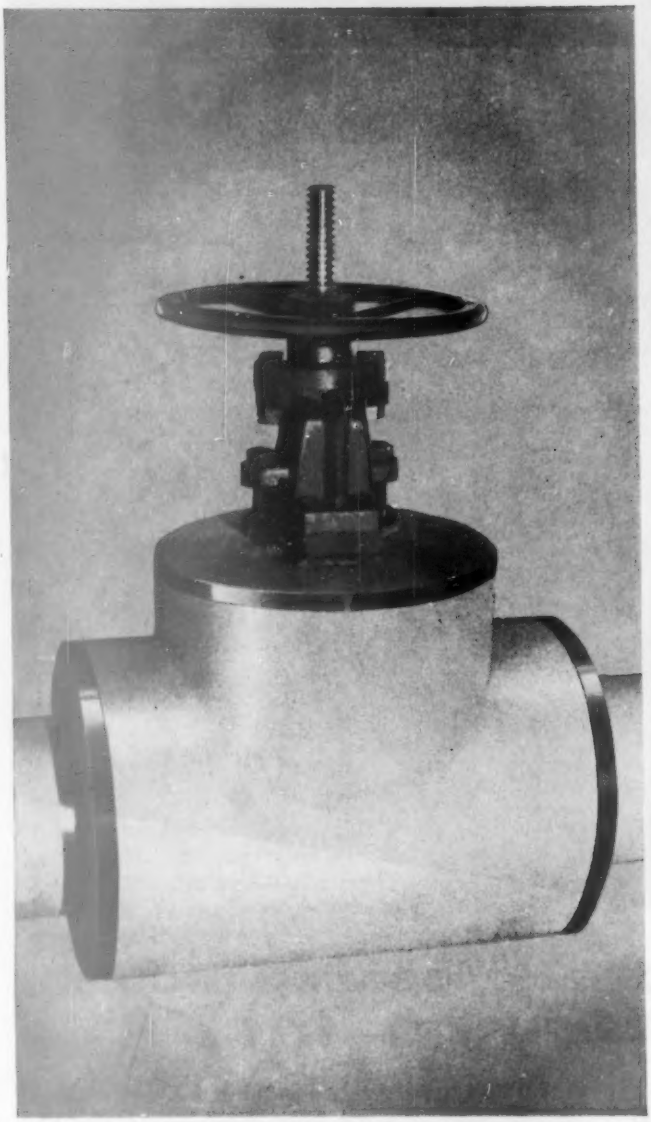
DELAWARE: Wilmington • **ILLINOIS:** Neiman Bearings Co., E. St. Louis • **INDIANA:** Ft. Wayne • Indianapolis • Muncie • Terre Haute • **MARYLAND:** Baltimore • **MISSOURI:** Neiman Bearings Co., St. Louis • **NEW JERSEY:** Camden • Newark • **NEW YORK:** Belanrol Corp., Buffalo • Niagara Falls • **OHIO:** Akron • Canton • Cincinnati • Cleveland • Columbus • Dayton • Elyria • Hamilton • Lima • Lockland • Mansfield • Painesville • Toledo • Youngstown • Zanesville • **PENNSYLVANIA:** Erie • Johnstown • Philadelphia • Pittsburgh • York • **WEST VIRGINIA:** Charleston • Huntington • Parkersburg • Wheeling

and

in the South → **DIXIE BEARINGS, INC.**

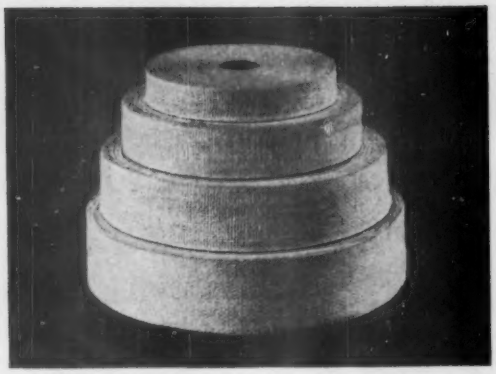
ARKANSAS: Little Rock • **FLORIDA:** Jacksonville • **GEORGIA:** Atlanta • **KENTUCKY:** Louisville • **LOUISIANA:** Baton Rouge New Orleans • **N. CAROLINA:** Charlotte • Greensboro • **S. CAROLINA:** Greenville • **TENNESSEE:** Chattanooga • Kingsport • Knoxville Memphis • Nashville • **VIRGINIA:** Norfolk • Richmond • Roanoke

For More Facts Write No. 232 on Information Card—Page 32



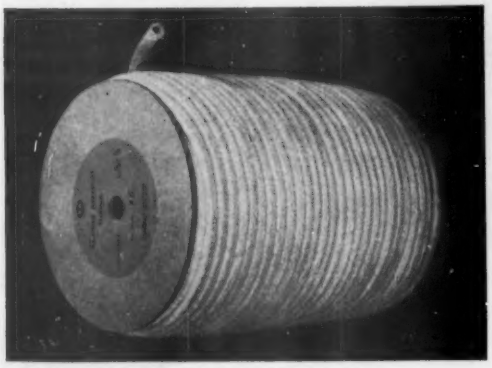
This pipe insulation for low, medium, and high temperatures requires no coddling!

"K&M" ZEBRA is a multi-layer, sectional-type pipe insulation. Deflection at breaking point is 2 to 4 times that of ordinary insulation. It's easy to cut and fabricate. Withstands shock and heat. Made of calcium-silicate-asbestos fiber bonded felts. Available in wide range of sizes and thicknesses. Write No. **242** on Place Mark Card—Page 32.



Fireproof and flexible insulation for wires, cables, and coils:

"K&M" Asbestos Tapes offer you a choice: non-ferrous tapes for high voltages, ferrous tapes for high temperatures. Made of quality asbestos fibers woven to uniform weave. For more information, write No. **243** on Place Mark Card—Page 32.



Extremely flexible insulation for transformer leads!

"K&M" Braided Tubing insulates wires against heat. Protects them from chemical attack. Made of Commercial and Underwriters' Grades of asbestos yarn. In variety of diameters. For more information, write No. **244** on Place Mark Card—Page 32.

"K&M" buyer's guide to quality

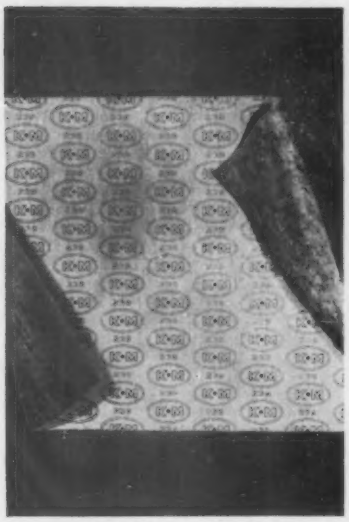
"K&M" asbestos products efficiently satisfy the most exacting requirements. They have a long service life . . . even under the severest operating conditions. They shave maintenance and replacement costs. Common to all "K&M" asbestos products is the reputation for quality . . . maintained since 1873.

Keasbey & Mattison



"K&M" high-heat-resistance asbestos cloth for safety garments!

Specially designed weaves for safety garments and as a reinforcement for all kinds of plastics and a host of other products. For more information, write No. 245 on Place Mark Card—Page 32.



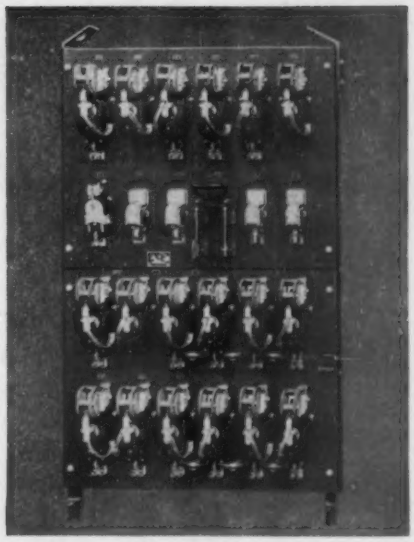
Compressed sheet packings for a wide range of applications!

"K&M" Compressed Asbestos Sheet Packings can be used for general industrial applications, Diesel engines, refrigeration industry, automotive, aircraft engines, and oil refineries. Grades for use against hot oils, gasoline, and refrigerants. Meets military and naval specifications, as well as aeronautical specifications. For more information, write No. 246 on Place Mark Card—Page 32.



Insulation material for caulking, packing and wrapping!

"K&M" Twisted Asbestos Rope Packing is ideal for caulking retorts, boilers, and ovens . . . Or, as a base for lubricated packings. K&M Asbestos Yarn for braided packings. For more information, write No. 247 on Place Mark Card—Page 32.



Electrical apparatus mounting that toughens with age!

"K&M" Ebonized Asbestos is an ideal insulating material for mounting switchboards, bus bar supports, cabinets, compartment linings, bench boards and testing tables. Withstands severe shocks and vibrations, and rapid temperature changes. Lightweight. Exceptionally high dielectric strength. Uniform density. For more information, write No. 248 on Place Mark Card—Page 32.



For manufacturing folded asbestos gaskets of high quality!

"K&M" Asbestos Gasket Cloth consists of quality asbestos yarn and fine brass wire strands twisted and woven, and covered with rubber friction compound. For more information, write No. 249 on Place Mark Card—Page 32.

asbestos products for industry

"K&M" produces asbestos products for industry, municipalities, and construction: Insulations, Textiles, Pipe, and Building Products. "K&M" engineers have pioneered many of the developments in the use of asbestos for industry. If you have a problem asbestos can solve, write to: **Keasbey & Mattison Company, Ambler, Pa., Dept. I-390.**

at Ambler | K·M BEST IN ASBESTOS

Keep Your Staff in Mind When Buying New Machines

By Charles H. Goddard

Vice President
Voicewriter Division, McGraw-Edison Company

THE MODERN office is in a state of change. The introduction of automation with a glittering array of office machines has brought about a reappraisal of methods and procedures. New business machines, conceived and designed as tools, are adding emphasis to the process of freeing individuals from repetitive tasks and time-consuming paperwork.

An increasing number of management seminars are devoted to discussing the psychology of individual initiative and performance. The theory is fine—and in purchasing departments where thought and planning have gone into the introduction of new equipment and methods, so is the practice.

These departments—and their companies—are realizing top benefits from their most costly investment: human beings. Too often, however, full value is not being received from the investment in both personnel and the new tools installed to make jobs easier. The reason lies not in the employees or the machines, but in the manner which they are brought together for the first time.

Psychological and material factors at a time of change-over require careful handling. The consideration given to individual and human values can spell the difference between (1) merely having new machines in the purchasing department and (2) enjoying superior personnel relations with increased productivity.



Full value on new office equipment, like this "lazy susan" table, won't be received unless the people who operate it are considered. The importance of new machines in simplifying individual jobs should be impressed on all personnel using them.

Resistance to change is inherent in most people. Reason: we are sure of what we have and fearful of what we don't understand. Fear and misunderstanding take over when management does not explain the benefits, in human terms, to be derived from new methods and equipment.

The installation of new equipment always entails a considerable expenditure of time, energy, and money. It is not a project undertaken lightly. Long planning by the purchasing agent, and often by top management, is involved. Specific benefits, savings, and overall advantages from the use of the equipment have been considered and evaluated.

Demonstrate Importance of Individual

Translation of these values into terms of the individual user is absolutely necessary before the goals can be fully attained. Justification of the new product or method is not the right approach; it should simply be a statement of the plus values which the new equipment will give to the user.

Such a demonstration of the importance of the individual person is certain to cut break-in periods to a minimum, generate

(*Please turn to page* 130)

For More Facts About Ad on Facing Page Write in No. 234→



but why guess when you can be sure...faster... with the remarkable mobile EXECUTIVE KARDEX

Mistakes can be costly. That's why executives who can't afford to be wrong depend on the Remington Rand Executive Kardex for correct on-the-spot information.

With the Executive Kardex, you just roll the facts you need to wherever you are. In the conference room . . . at the plant . . . in the office.

It quickly cues you on up-to-date information with colored marginal signals; gives whole histories at a glance.

So stop wading through unrelated material, costly, time-consuming reports. Get the facts you need on inventory, sales, personnel, ledger, production and credit . . . *on the spot* with the Remington Rand Executive Kardex. It pays to be right — *right where you are!*

All Remington Rand Equipment also available on long or short term lease plan.

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DIVISION OF SPERRY RAND CORPORATION
122 EAST 42nd STREET, NEW YORK 17, N. Y.



"Modern posting machines like nothing better than to work with famous L. L. BROWN

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Office Equipment

(*Continued from page* 128)

enthusiastic acceptance, and encourage the greatest possible use from the new tool.

Each item of office equipment—whether it be a photocopy machine, typewriter, desk, calculator, dictating unit, or data processing center—has its own unique set of user values. However, new equipment and methods of all types have certain common values which can be expressed in terms of the employee.

Among the gains which must be stressed when introducing new equipment, experience has shown the following to be most acceptable:

Individual recognition—Explanations by department heads in briefing sessions and informal talks are needed to get this point across.

Employees will not fail to realize the personal value of new machines when reminded of the times they worked late to get out certain overdue reports. The buyer and secretary alike soon become aware that their interests are being considered. They become secure in the knowledge that "the company" understands their contributions to the successful operation of the department.

Status—Personnel directors are no longer surprised to hear girls in search of jobs ask "Will there be a telephone on my desk?" Numerous studies have shown that even such a commonplace piece of office equipment as the telephone adds status. The acquisition of an electric adding machine while others are using manuals represents a real achievement.

For this reason, when new equipment is introduced, management should take advantage of this emotional factor. Let the users know in clear, certain terms that their time is valuable to the company. Tell them that their individual initiative is appreciated and that the electric typewriter, dictating unit, or whatever will help them become more valuable members of the team.

Efficient performance—Another technique employed by progressive purchasing agents is to show that the new method or machine is easier and can lead to superior performance.

Pride in one's work is an important morale factor. The company that lets its employees know they are being supplied with "tools" that enable them to work better, more pleasantly, and more efficiently is contributing to overall morale.

Participation—Selection of new equipment must, of course, be retained as an executive decision. Anything else would be impractical. Despite this, it is extremely important to have supervisory and using personnel take an active interest in the decision.

Here's how one large midwest company solved this difficult and delicate problem: Purchase record cards were stored in conventional file cabinets. A program to replace these cabinets with automatic, self-leveling files was under consideration. The director of purchases brought in two slightly different models for a try-out period and asked for suggestions to help decide which was better suited to the needs of the department.

Let the Users Participate

Each girl was given an opportunity to operate the files and become familiar with them. Enthusiasm for the machines rose each day that they were on trial. When the decision to buy was made, it was loudly acclaimed—the active participation by the users had paid off.

Translation of values from planning session to personnel should never be a separate, time-consuming project of management. It should rather be undertaken as a matter of day-to-day relations, with continuing concern for the individual.

With the mechanization of the office, every individual becomes more important to his department and his company. The steps taken by management to make this clear when introducing new methods and equipment will more than pay off in better understanding and improved operations in every department.



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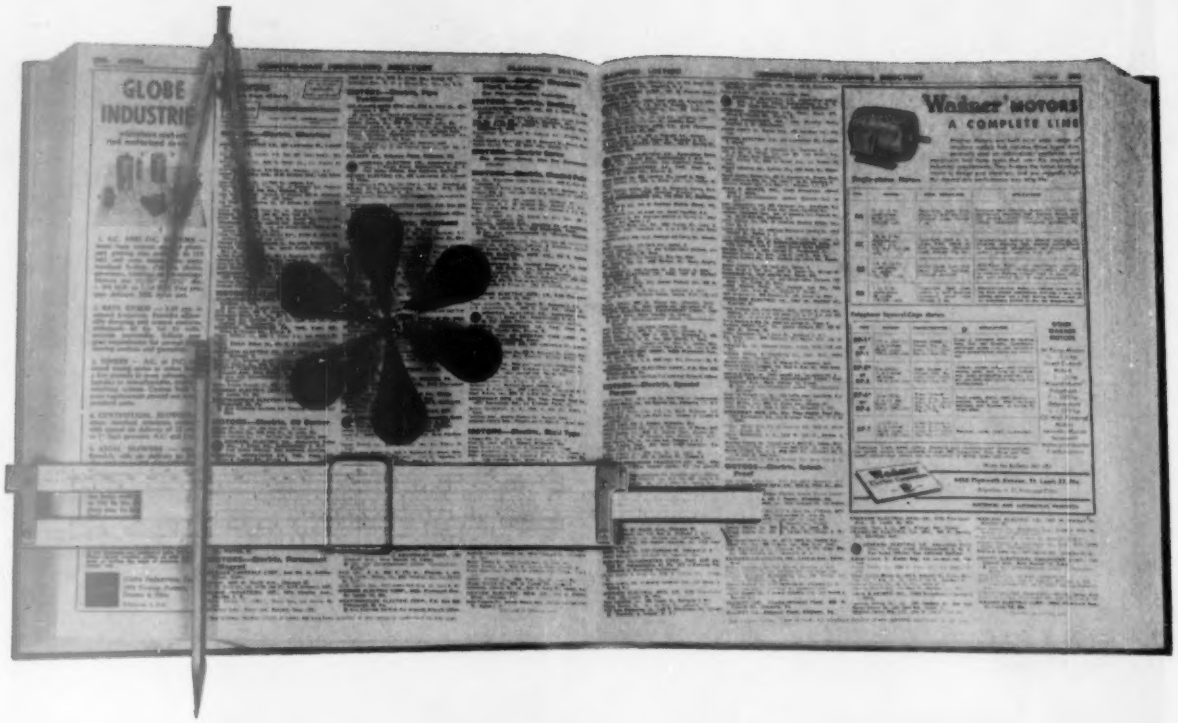
Phone local Verifax dealer for demonstration (see Yellow Pages under duplicating or photocopying machines), or write Eastman Kodak Company, Business Photo Methods Division, Rochester 4, N. Y., for booklet describing all Verifax Copier models.

Price quoted is manufacturer's suggested price and subject to change without notice.

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Kodak
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For More Facts Write No. 236 on Information Card—Page 32



*Value Analysis Starts Here

Good suppliers are the foundation of any value analysis program. CONOVER-MAST PURCHASING DIRECTORY gives you a reliable list of manufacturers of industrial products. It gives you:

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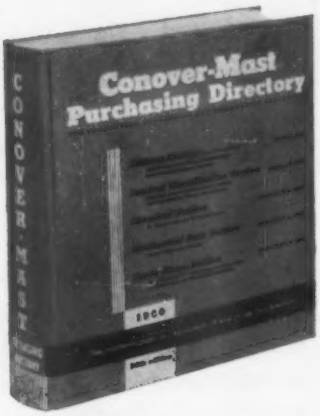
address,

telephone number,

size of company,

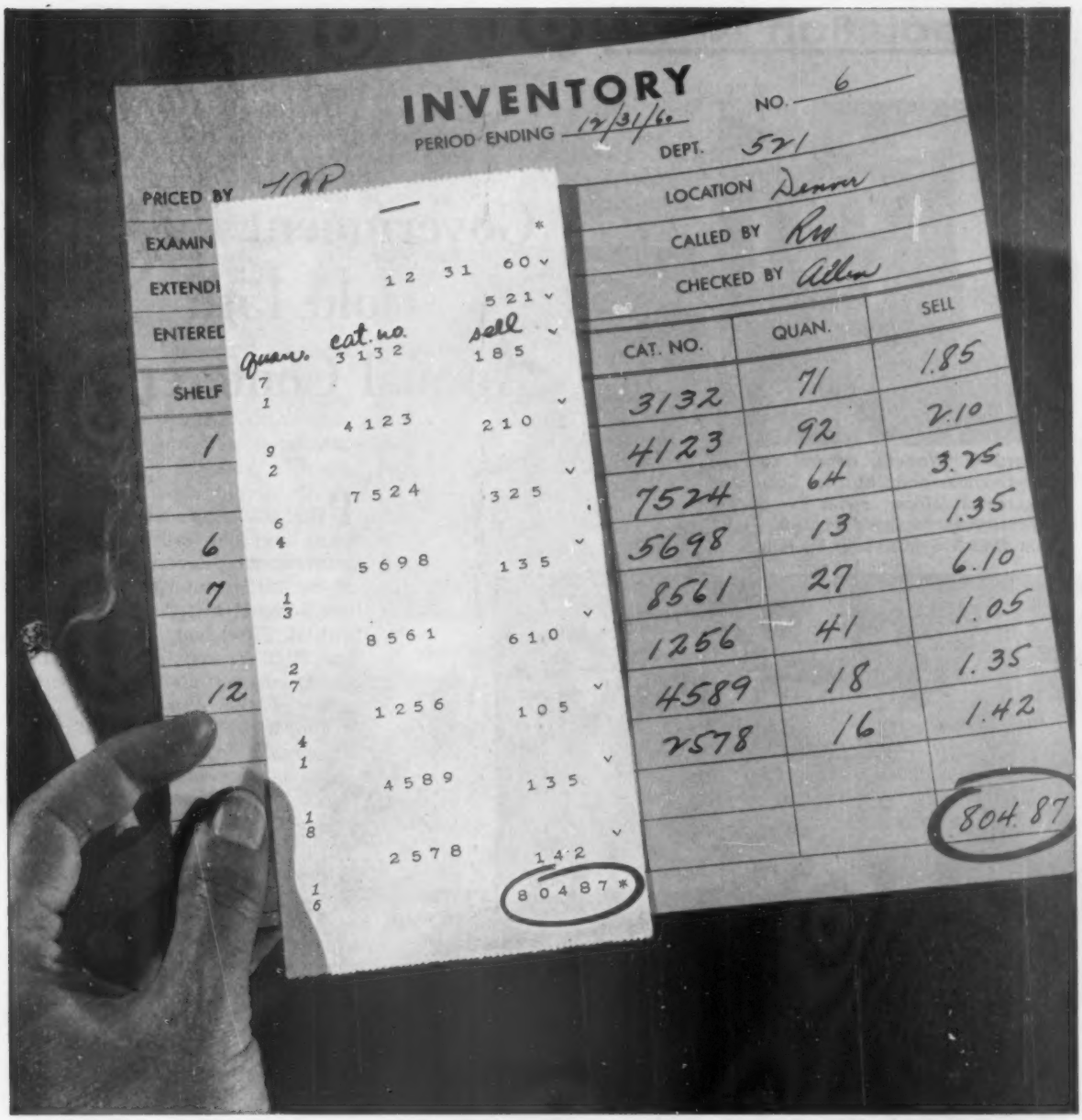
and necessary technical data.

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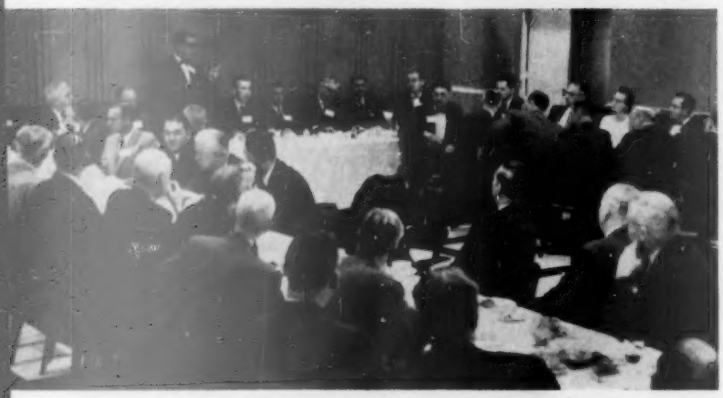


Rexford G. Wessells, general conference chairman and District of Columbia procurement officer, opens the three-day meeting. Incoming N.I.G.P. President Otto R. Winter is at his right.

Government Buyers Hold 15th Annual Conference

PUBLIC purchasing officials were urged to talk about their achievements at every opportunity at the 15th annual conference of the National Institute of Governmental Purchasing. Major General R. T. Evans, Jr., deputy, the Quartermaster General, Department of the Army, said: "Be patient with your critics, but publicize your good practices. Don't wait until somebody picks on you."

Over 900 purchasing agents and their wives, representing federal, state, and local governments, attended the four-day conference held at the Shoreham Hotel in Washington, D. C. New N.I.G.P. President Otto R. Winter, P.A. for New Britain, Conn., presided



Four well-attended breakfast meetings were held each morning. Here Richard A. Quigley, town P.A. of Nutley, N.J., addresses the cities and counties group.

Executive Vice President Albert H. Hall (far right) talks to other N.I.G.P. officers: (l. to r.) Treasurer Rexford G. Wessells, D.C. procurement officer; President Otto Winter; and Vice Presidents G. Lloyd Nunnally, director of purchases and supply of the Commonwealth of Virginia, and Verne O. Gehringer, San Diego county P.A.



and Rexford G. Wessells, procurement officer of the District of Columbia, was conference chairman. Albert H. Hall, executive vice president of the N.I.G.P., managed the details.

Major speakers included Harold E. Churchill, president of the Studebaker-Packard Corp., Earl W. Kintner, chairman of the Federal Trade Commission, and Robert A. Bicks, assistant attorney general. In the professional program, seminars and round-table discussions were devoted to measuring purchasing performance, cooperative purchasing, salvage and surplus sales, buying drugs and pharmaceuticals, and other subjects.

All delegates showed concern over rigged bidding and unethical practices. Assistant Attorney General Bicks suggested that governmental P.A.'s work with their local attorneys or solicitors to institute damage suits in those cases where they purchased equipment from companies indicted for collusion in bidding.

Kintner pointed out ways in which the Federal Trade Commission can help fight dishonest practices. "We can prevent de-

(*Please turn to page* 136)



John F. Ward, purchasing agent of the City of Chicago, and William E. White, finance director of Skokie, Ill., discuss a purchasing problem.



John H. Corcoran, Cambridge, Mass., listens intently as Charles M. Healy, Springfield, Mass., takes notes during the session on identical bidding.



The 86 product exhibits enjoyed consistently large attendance between and after meetings.



In a luncheon highlight, Albert Hall presents the N.I.G.P. distinguished service award to John G. Krieg, city purchasing agent of Cincinnati. This was the fifth time in 16 years the award has been made.



Canadian public purchasing agents meet to discuss some of their problems. The session, led by Ray Nottage (far right), city purchasing agent for London, Ontario gave the P.A.'s a chance to air their problems.

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BEAN

For More Facts Write No. 238 on Information Card—Page 32

Association News

(*Continued from page* 135)

ceptive selling practices which may be as unfair to official purchasers as they may be to the individual man in the street," he said. "We can also provide for you the prevention of antitrust violations in pricing and dealing of which you as State and local government purchasers may be the victims." In conclusion he suggested that the P.A. can do three things: "Inform yourselves, inform the public, and inform the Federal Trade Commission."

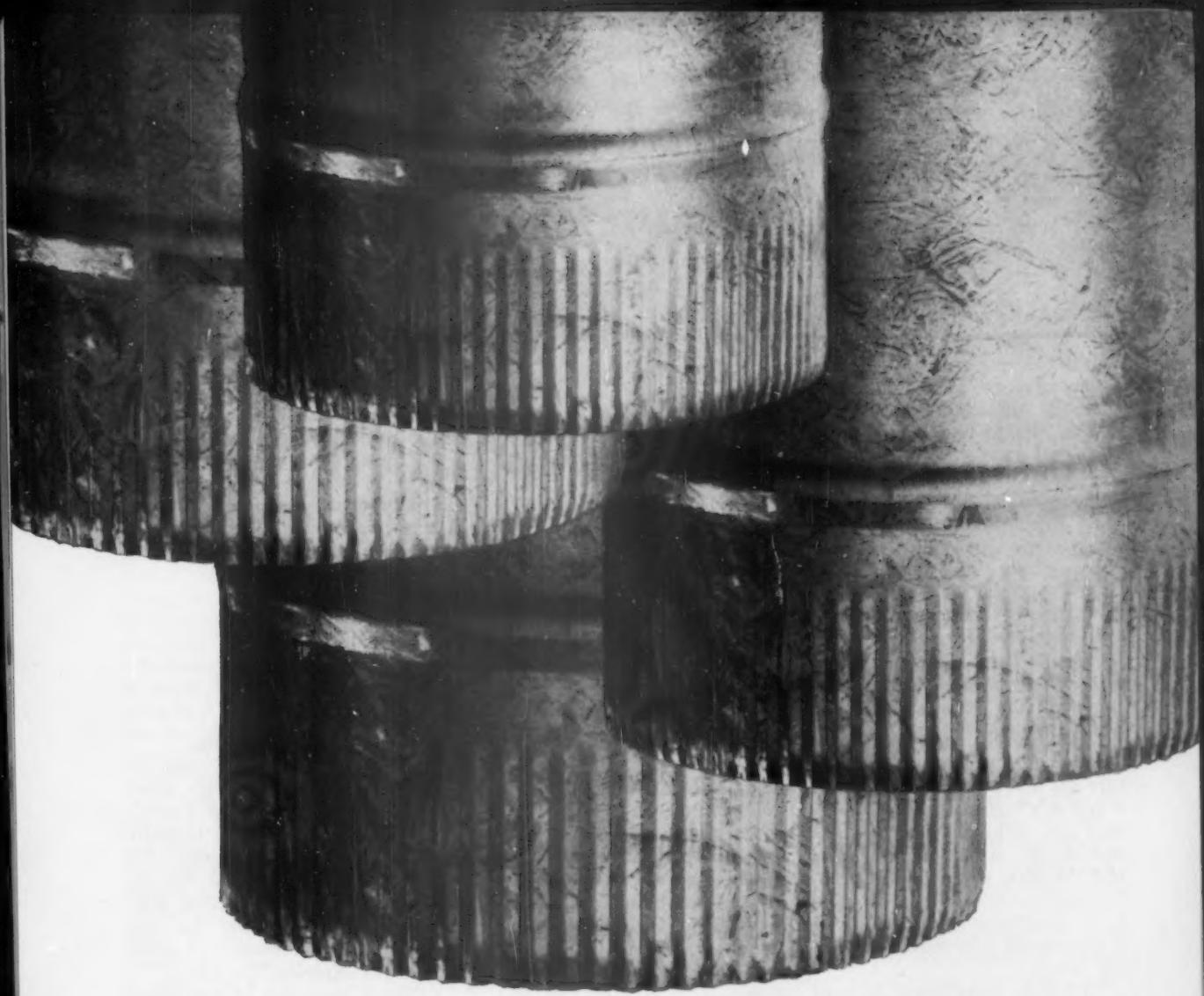
Speaking at the same session, Wes J. Budziszewski, director of purchasing of Milwaukee County, discussed how to improve everyday relations between buyers and sellers. "The buyer who regards the vendor as an extension of his business and an extension of the same economical channel, is indeed a wise man," he said. "A steady stream of business is the most economical and most healthy condition for both."

The purchasing profession got a boost from Harold Churchill. "You can make your maximum contribution only when you participate in and influence the buying decision as a full partner, at the policy level. I have always believed that no purchasing function can be truly effective unless purchasing is represented in top operating councils."

He urged, however, that government purchasing agents consider placing more contracts with small business. "The defense department recently published figures showing that the share of defense contacts placed with small business firms has fallen from 25% in 1954 to 16% in 1960," he said. "In short, the giants of industry, with their vast facilities, are now grabbing more of the business than ever."

A highlight of the official luncheon was the presentation of the N.I.G.P. distinguished service award to John G. Krieg, city purchasing agent of Cincinnati and a past president of N.I.G.P. This was only the fifth time the award has been granted in the last 16 years.

For More Facts About Ad on Facing Page Write in No. 239→



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Role of Purchasing Outlined At 8th District Conference

WHAT purchasing is—or should be—doing to prepare for the future got a thorough going-over at N.A.P.A.'s Eighth District Conference in Albany. The experts looked at many things, from N.A.PA. dues to the import problem, and challenged their listeners to do something about them now if purchasing is to move ahead in the future.

"N.A.P.A. must move forward with an expanded program to advance purchasing and improve its professional status," President Paisley Boney said in a warning that reflected the whole spirit of the program. After exploring N.A.P.A.'s "present weaknesses" he said that the association cannot continue as it is now. "We need an increase in dues" he said flatly. "The three major committees — Public Relations, Value Analysis-Standardization, and Professional Development — must come up with definite programs that will justify an increase in dues."

Boney took a strong, down-to-earth stand on a very touchy subject. Even those who are cool to the idea of a dues increase acknowledged that he had made a strong case for the change.

N.A.P.A. affairs also came in for frank discussion at the close of the conference when Executive Secretary-Treasurer Howard Ahl declared that shaping the growth and character of the association is not something that should be done "from the top down." "It is a matter of grass roots participation," he said.

"Three thousand of our members are engaged in activity at some level of association work," Ahl revealed. "But at least 50% of our members don't even attend meetings."



WELCOME TO ALBANY is extended by Mayor Erastus Corning II, as J. Dukehart Chesney (center) vice-chairman of the conference, and Edward S. Waters, program chairman, look on. The Mayor noted the importance of purchasing in government and industry.



AT THE PRESIDENT'S LUNCHEON, N.A.P.A. chief Paisley Boney laid it on the line about the association's finances and progress. One of his humorous sallies gets a laugh from Duke Chesney (left) and District 8 V.P. Frederick C. Esser.

The relationship of the new science of data processing to purchasing came in for special attention for a full afternoon on the first day of the conference.

"If you want more recognition," said panel chairman John F. Snedeker, of Binney & Smith, "don't forget to look into data processing. This is not something just for the big companies. Companies of all sizes and types can use it. It will give you a tremendous amount of data in a short time. This will improve your management know-how and result in big savings.

"But be sure you can improve your operations with data processing, however, before you go into it. Unless it can save you money or give you your necessary records fast, it's strictly for the birds."

Following Snedeker's talk, two separate data processing sessions were held—one for beginners, and one for those purchasing agents already using or developing automated purchasing systems. The first featured presentations by Wallace A. MacLennan, Standard Register Co.; Robert J. Casey, Eastman Kodak Co.; and John R. Mylott, Allied Chemical Corp. The second was conducted by Les Waters, General Electric Co.; William Westlake, Westinghouse Electric Corp.; and Jack Lane, Eastman Kodak.

The present and future of professional purchasing development, and what "others think of us," were analyzed at the Professional Development session. Chairman Walt Willets opened the panel discussion by declaring that professional standing depends on performance. "We don't deserve respect or confidence unless our performance has been good," he said. "And even then, our performance must be better."



FIRST RECIPIENT of Eighth District's Harry L. Erlicher Award for distinguished service to the cause of purchasing is, by unanimous choice, none other than former General Electric V.P. Harry L. Erlicher.

Panelist Vic Pooler, Carrier Corp., said "We must set our sights high. Don't be afraid to face up to our shortcomings and try to overcome them."

Urge Improved Communications

Dr. Herbert Van Schaack, State University of New York, told purchasing agents that they are disliked and distrusted because they are considered a threat to others' security and status. "You are newcomers," he said. "In many cases you have blundered ahead, and people have feared you were taking over some of their prerogatives. So when the chance comes, they try to make scapegoats of you."

Dr. Van Schaack suggested that P.A.'s broaden their own perspectives first before expecting others to broaden theirs. "Try to improve your communications," he said. "Listen, and seek answers."

One of the liveliest and most provocative value analysis programs ever seen at a district conference was conducted by C. M. O'Grady, value consultant, General Electric Co. Ed Drew, Solvay Division, Allied Chemical Corp., was Chairman of the session.

Irving Lipkowitz, economists for Reynolds Metals Co., warned the purchasing agents that "there are many dangers when you buy abroad on the basis of price alone." He said such P.A.'s give up the advantages they get from a strong U.S. economy and the technical assistance available within this country.

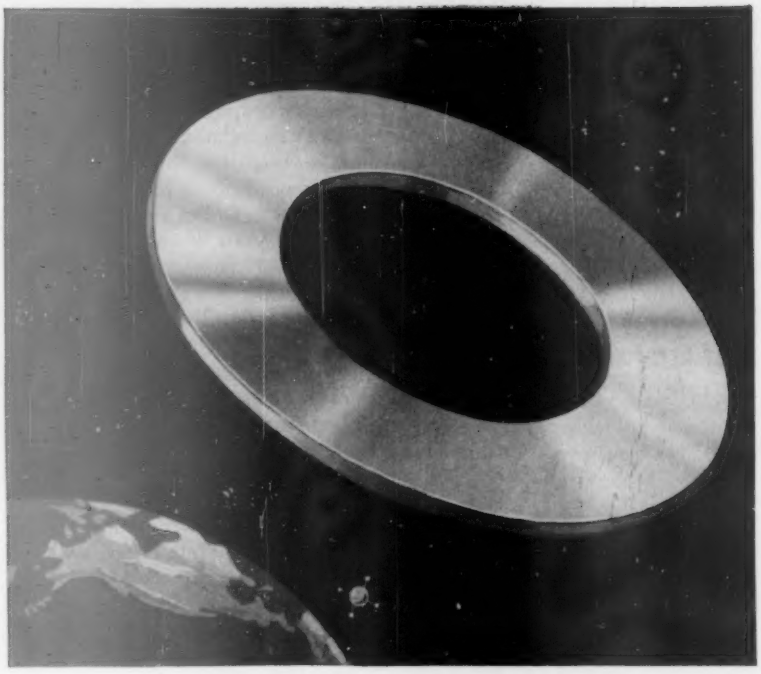
The men, money, and material that modern purchasing needs to become a truly managerial function were discussed by Harry Moore, director of purchasing, International Business Machines Corp. Mr. Moore encouraged purchasing executives to compete with other departments in bringing outstanding men into their departments and in paying them good salaries. He made a strong plea for a better understanding of the materials management concept.

A WRY COMMENT by IBM's Harry Moore during his talk on purchasing management is enjoyed by Fred Esser.





PROFESSIONAL STANDING of purchasing agents was critically analyzed by Dr. Herbert Van Schaack, State University of New York (left), and Victor Pooler, Carrier Corporation (right). Chairman Walt Willets of Conover-Mast is shown presiding at the session.



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For More Facts Write No. 240 on Information Card—Page 32

Association News

District 9 P.A.'s Hold Outstanding Conference

A cordial reception and an outstanding program greeted purchasing agents at the recent New England Purchasing Conference in Hartford, Conn.

The one-day affair offered many ideas which ranged over the entire field of purchasing. Among the top-notch speakers who shared their thoughts with members of N.A.P.A.'s District 9, were David W. Sampson, McGill Commodity Service, and E. M. Krech, J. M. Huber Corp.

Sampson addressed himself to the "Economic Outlook." He told the group that our increasing population will bring remarkable changes in raw materials, finished products, and in business procedures.

Speculative materials, such as fuel and rubber are separate complex markets, Sampson said.



David W. Sampson

"Most of you do not have to analyze these markets, but the dollars you spend are just as important and must be spent just as wisely as those dollars used to buy the more speculative materials.

"Therefore, you must, in your own mind, predict the future outlook of general business and its effect upon the specific commodities in which you are interested."

The McGill vice president told his audience that conditions today "are similar to the 1957-58 period, with inventories of finished goods up, interests rates high, and con-

(*Please turn to page* 144)

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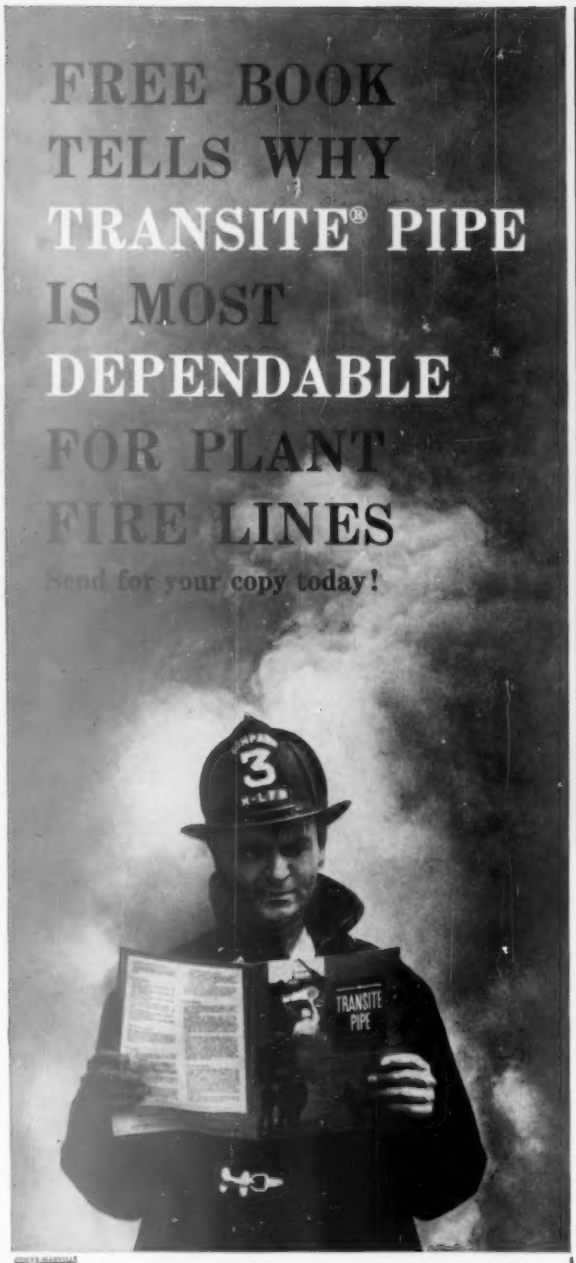
Last year, our staff of 322 package and research counselors answered outside inquiries at the rate of one every seven minutes.

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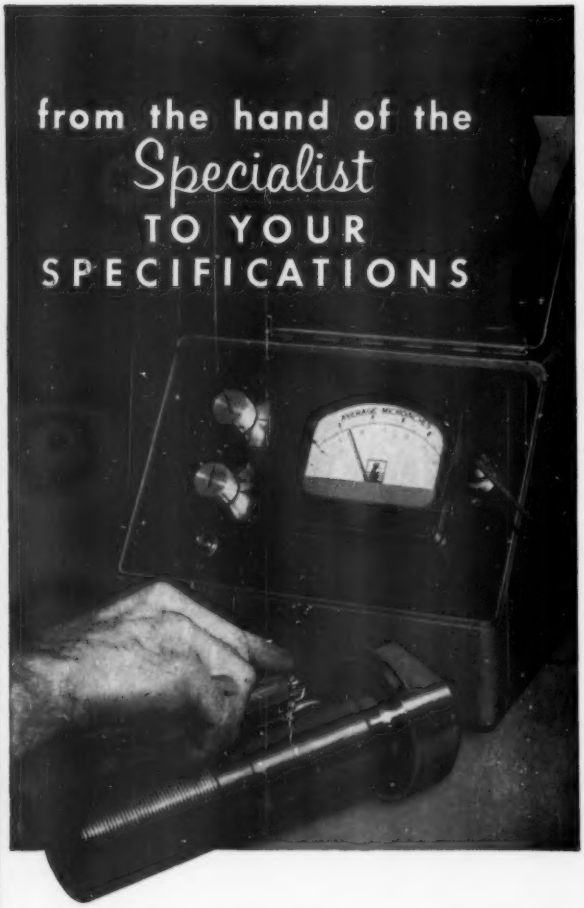
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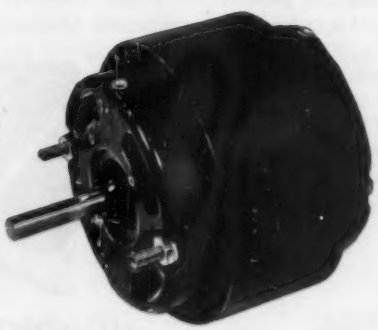
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For More Facts Write No. 251 on Information Card—Page 32

Nylatron® GS Wear Strip eliminates lubrication



By using a .020" thick NYLATRON GS nylon strip between the feeder tube stock reel and its support base on this screw machine, lubrication and messy oil drip were completely eliminated. Economical NYLATRON GS, with non-galling, non-scratching characteristics, also prevented abrasive wear on the sliding metal surfaces, and the strip lasts for years.

Photo: Courtesy Dick Bros., Inc.

NYLATRON GS (a compound of nylon and molybdenum disulphide*) offers both manufacturers and users many advantages over regular nylon and metals in applications such as this. In addition to its self-lubrication characteristics, NYLATRON GS has greater wear resistance, higher strength, greater rigidity, superior heat resistance and improved dimensional stability. Yet it costs no more than standard nylon.

NYLATRON GS stock shapes are available in a complete range of rod, strip, tubing and plate forms. Rapid, low-cost fabrication is accomplished on standard metalworking equipment. Molding powders are also available.

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*Patented



POLYPENCO industrial plastics

The Polymer Corporation of Pennsylvania

Reading, Pa.

Export Polypenco, Inc., Reading, Pa., U.S.A.

For More Facts Write No. 252 on Information Card—Page 32

Association News

(*Continued from page* 140)

sumer credit badly overextended."

Sampson added that 'Your personal financial position is important to the general economy, for we now have reached the stage where we must pause to pay off debts since such a large portion of our total income is already earmarked for fixed charges."

To round out the outlook, Sampson gave a summation of the general economic picture: "Heavy goods industries are already in a serious slump, and inasmuch as the economy is not capable of fully utilizing all-out production, competition will remain keen, and inventories of raw materials held by customers, limited.

"In the nondurable category, both production and consumption have held up remarkably well.

"The two dominating influences on our economy are overextended financial obligations and competition, both from domestic and world suppliers. Don't be surprised if, temporarily at least, we will enjoy that rare treat of some price deflation.

"You are no longer chasing a limited supply of goods, knowing that if you buy too much it will be worth more tomorrow. Your department has taken on new status. This is a period when you and the entire purchasing profession can make astonishing contributions to your company and to the national economy."



E. M. Krech

Krech, in his talk on "Reports to Management," chastised purchasing agents for not submitting

(*Please turn to page* 148)



Why the Purchasing Agent held a "*hand drying*" session

He knew a purchasing agent's hands required no more or no less drying than those of anyone else in the same company. And he wanted to show the other company executives that they could cut paper costs by using the towels he was putting to the test.

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For More Facts Write No. 253 on Information Card—Page 32


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REA Express is the national and world-wide *rail-air-sea-highway* service of Railway Express . . . the simplest way to ship. You deal with just *one* carrier—REA—all the way from origin to destination.

You can ship anything, anywhere, any time via the REA network of domestic and international surface and air services. Nationwide coverage to 23,000 communities in the U.S. No charge for door-to-door delivery (within published limits).

New low express rates are in effect on many, many commodities. Now you can ship at rates that are comparable to—in many cases lower than—rates via parcel post and other so-called "low-cost" carriers.

Service? No other organization can match REA—it's *complete!*



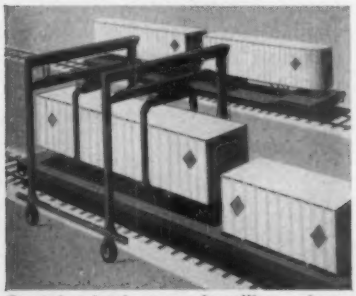
Multimillion-dollar modernization. This new "key-point" terminal is typical of REA's investment in new services and new ways to serve you better.



New over-the-road truck routes. Many new REA Express trucks supplement rail service, insure speed and frequency for intercity shippers.



New coordinated surface and air freight service enables you to combine air freight speed with fast REA pickup and delivery.



Containerized cargo handling, piggyback shipping. New REA methods minimize handling, simplify transfer, save time and costs, speed delivery.



Air Express. This priority, low-cost air service of REA and the airlines spans the U.S. with pickup and delivery by special Air Express trucks.



World-wide international services. REA customhouse brokers clear your shipment fast, speed it by air—or surface on REA's through bill of lading.

Special new low rates on these and many other commodities:

- Farm implements and parts
- Rugs and carpets
- Books and printed matter
- Shoes and other footwear
- Wearing apparel
- Automobile, truck and trailer parts
- Piece goods
- Curtains and draperies
- Sheets, towels, tablecloths
- Photographic equipment and supplies
- Hand tools

This is only a partial list applying between all points . . . call your local REA office if *your* commodity is not included here. If it *is*, call for the complete rate story—it will show you big savings.

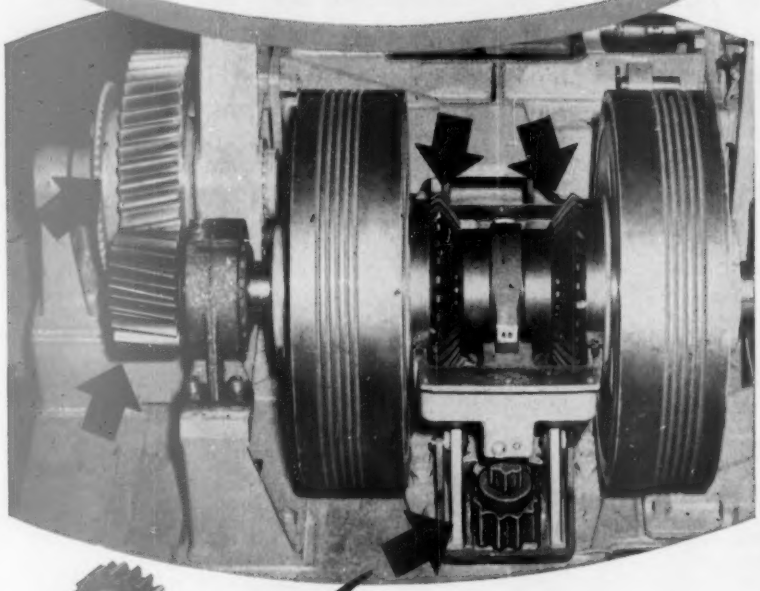
RAILWAY EXPRESS AGENCY

RAIL • AIR • SEA • HIGHWAY

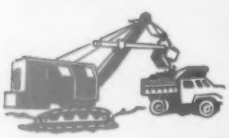
SHIP ANYTHING · ANYWHERE · ANYTIME VIA **R·E·A EXPRESS**

For More Facts Write No. 254 on Information Card—Page 32

Do You have requirements for "Special Gears?"



✓ CHECK with FAIRFIELD!







"Fairfield has furnished us with bevel and spur gears for many years and we are highly satisfied with their product," states one of America's best known makers of shovels, cranes, and draglines in referring to the above picture. Each gear (*see arrows*) is precison produced to match this builder's specifications for *plus value* quality.

Making gears to meet exacting specifications is our business. The special or unusual requirements you have for design, size, finish, tolerances, materials, and heat treatment are often "standard" at FAIRFIELD. Here, every facility needed is available for production of fine gears EFFICIENTLY, ECONOMICALLY. *LARGE or SMALL, your inquiry will receive prompt attention.* CALL or WRITE.

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MINING MACHINES • ROAD GRADERS • BUSES • STREET SWEEPERS • INDUSTRIAL LIFT TRUCKS

For More Facts Write No. 255 on Information Card—Page 32

Association News

(*Continued from page* 144)

reports. He said that most P.A.'s when asked why they do not make such a report give these weak, lame excuses: "No time", "I don't have the information", or "Management has not expressed a need for it."

The only plausible reason, said Krech, is that you don't know how to report. He urged the group to find out and he listed a number of articles from PURCHASING Magazine which would be helpful in organizing a report program.

Later in the morning there was a talk by Dr. David D. Komisar, psychology professor at Hillyer College, University of Hartford. He discussed "Human Needs and Motivations." It is important, Dr. Komisar pointed out, to learn why people act and react the way they do.

"Of course," he said, "you can't possibly know the complete environmental and cultural background of every salesman who comes into your office. "But," he added, "give understanding a chance and you will find your attempts filled with greater successes."



Paul J. Carroll

The balance of the program was devoted to provocative and informative panel discussions. "Materials Management" was the first, moderated by Paul J. Carroll, of Pro-phy-lac-tic Brush Co. Appearing with him were: Harold Bloom, Avco Everett Research Laboratory; Eugene D. Emigh, American Hardware Corp.; and

(*Please turn to page* 152)



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HALLOWELL

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Only ERECTOMATIC gives you these features:



Quick Shelf Installation. Position shelf support. Slide in shelf, press latches. Takes only seconds. No tools needed.



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COLUMBIA-HALLOWELL Division **SPS** **JENKINTOWN 31, PA. • SANTA ANA, CALIFORNIA**

where reliability replaces probability

For More Facts Write No. 256 on Information Card—Page 32

Most efficient, most economical way
to line drums, cartons, cans, pails

GER-PAK

POLYETHYLENE

LINERS IN ROLLS



SAVE WORK!

Just slip GER-PAK Liners onto any holder above work area. No handling problem!

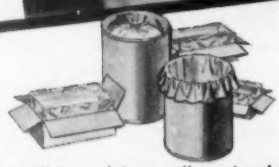
SAVE TIME!

Pull Liner down over mandril. Then zip off quickly, cleanly at perforation!

SAVE FUSS!

No smoothing-out by hand! Insert mandril and Liner into container, "cuff" around top, remove mandril!

For drums
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- Quality-made to seal out dirt, moisture, all contamination!
- Chemically inert to protect containers!
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- Available gusseted and non-gusseted!
- Tie-off or peel-over construction!
- LEAKPROOF DOUBLE SEAL optional upon request!

Write Dept. DL2 for samples.

the short way to say superior polyethylene sheeting

GER-PAK®

GERING PLASTICS, division of STUDEBAKER-PACKARD CORP.,
Kenilworth, N. J.

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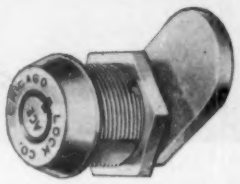


THE KEY TO YOUR SECURITY DESIGN PROBLEM

If the equipment or product you are designing should have a lock, it should have the unique Chicago ACE® Lock. The above key fits the circular keyway of an ACE lock and is as symbolic of maximum security as it is different from conventional keys.

Because of the intricate tumbler combinations possible in a Chicago ACE Lock, you can specify your own registered, unduplicated key cut with duplicate keys available from the factory only.

To learn more about the advantages of ACE and the complete line of Chicago Locks, write for a copy of our catalog and bulletins.



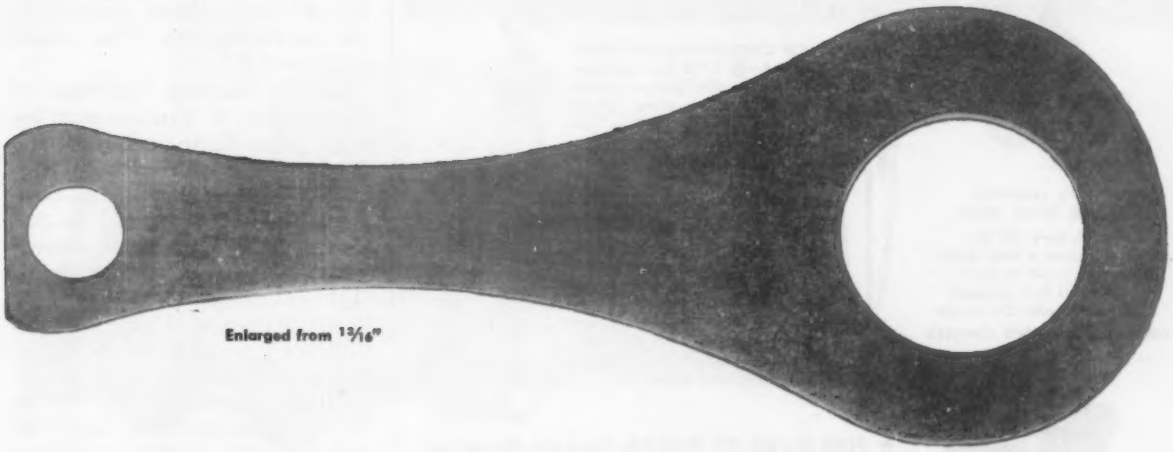
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They're both strip products, but . . .

RIVERSIDE-ALLOY continuous casting can make the difference!



Enlarged from 13/16"

Profitable strip products or expensive rejects . . . the difference is *how* your alloy was cast. *Exclusive* Riverside-Alloy *continuous casting* methods produces the ideal metal . . . no impurities, no gas holes . . . but a dense, homogeneous casting, 100 per cent fault-free.

Result: Riverside-Alloy strip, rolled from Riverside-Alloy castings, is the finest you can buy . . . never a hidden defect to show up in thin gauges, under severe die forming.

Next order, specify Riverside-Alloy . . . profit from the benefits of continuous casting . . . eliminate your reject problems. *Riverside-Alloy Metal Division, H. K. Porter Company, Inc., Riverside, N. J.*

RIVERSIDE-ALLOY METAL DIVISION PORTER **H. K. PORTER COMPANY, INC.**

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For More Facts Write No. 259 on Information Card—Page 32

Choice of the wise buyer who compares...

CM HOISTS

CM METEOR ELECTRIC WIRE ROPE HOIST ½ to 5 ton capacities—Compact, enclosed design. Low headroom. Continuous duty motor with thermal overload protection for heavy duty service. Precision bearings and helical gears for long life. Only 110 volts at push button control. Hook suspension; plain, geared or motor driven trolley.





CM LODESTAR ELECTRIC CHAIN HOIST—⅛ to 2 ton capacities—First truly heavy duty version of small electric hoist. ¼ ton model weighs only 51 lbs. Heavy duty self-adjusting brake, plus exclusive regenerative electrical braking. Upper-lower safety limit switches. CM-Alloy load chain. Single and three phase.

HAND OR ELECTRIC CHAIN OR WIRE ROPE

CM makes them all! So you can choose a hoist that's perfectly suited to your specific needs in a compact, rugged and safe CM design.

CM TROLLEYS AND CRANES



CM CYCLONE Hand Chain Hoist—¼ to 10 ton capacities—Easy to carry. One ton model weighs only 36 pounds. Made of tough aluminum alloy. CM-Alloy load chain. High efficiency. Lifetime lubrication.



CM PULLER—"The One Man Gang"—¾ to 6 ton capacities—Lifts or pulls at any angle. Lever handle operation Automatic load brake holds at any point. ¾ ton model weighs only 14 pounds and fits in a tool box. CM-Alloy load chain.



● **FOR OVER 75 YEARS,** Chisholm-Moore has offered hoist buyers the newest and most efficient designs, the most rugged construction, and the greatest number of valuable operating and safety features. CM hoists operate with a very minimum of maintenance. They give years of satisfying service.

Request catalog and name of local stocking distributor.

CM HOISTS

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For More Facts Write No. 260 on Information Card—Page 32

Association News

(*Continued from page* 148)

Thomas C. Fecteau, General Electric Co.

The upper echelon of N.A.P.A. executives brought messages of "hard work and a challenging year ahead" to the district. Paisley Boney, national president, was the featured speaker at the banquet.



Eugene D. Emigh

G. W. Howard Ahl, executive secretary-treasurer, opened the afternoon program with "To All from Ahl." Herbert Layport, District 9 vice president, reported to the membership on "The Affairs of District 9."

Mather Harding, chairman of the District 9 Vasco committee led a panel discussion on "Value Analysis-Standardization." Program chairman Carmen A. Dragone, Hartford Steel Ball Co., included these nationally-known figures for this panel: James M. Hill, Jr., Westinghouse Electric Corp.; Wilbur J. Pierce, Detroit Edison Co.; and Burnett Baron, Market Forge Co.

Pierce covered the topic "Value Analysis For The Little Guy." He said that value analysis has grown in recent years. It initially started as a purchasing function, he said, and soon became an entirely separate operation—and in some cases, a separate department.

The Detroit purchasing executive noted these forms that value analysis has taken: the committee approach, the value analyst, the value analysis group or department, and the value engineering concept.

(*Please turn to page* 154)





New, High Capacity Vans Move High Value Items with Softer Air-Cushioned Ride



Greater Accessibility for forklift handling at both side and rear . . . flexible double-decking advantages as shown in top photo.



America's Most Recommended Mover

● You can count on trouble-free moving for *any* high value equipment you make. Use of these specially designed vans offers maximum utility and protection no other carrier can give.

Higher, wider doorways at side and rear make it easy to forklift bulky loads safely into the van. Tie-down rings in the floor, as well as in walls, make the securing of valuable articles a quick and easy operation. New-type tandem axles with air suspension so ': up road shocks and cushion the ride.

You also gain obvious advantages in time and costs saved by not having to pack or crate expensive equipment and exhibits. Careful Mayflower handling and padding provide the guarantee of safety you require. Scheduling and delivery is supervised by experienced moving men . . . backed by the reliable, world-wide organization of Mayflower, largest owner of moving equipment.

You won't know what satisfaction means until you first use Mayflower!

AERO MAYFLOWER TRANSIT COMPANY, INC. • INDIANAPOLIS, INDIANA

For More Facts Write No. 261 on Information Card—Page 32

No. 6 in a series of washroom survey comments from "SBS soap counselors"

We showed them a money-saving approach to washroom maintenance!



James B. Workman,

SBS Soap Counselor on the Eastern Seaboard, has helped many plants update their clean-up practices. Here's his account of a survey at a leading wire and cable manufacturing plant:

"The condition of the washrooms was not up to their desired standards . . . even though maintenance costs were much higher than they should have been. The culprits responsible were easy to pinpoint: a scrub soap, disinfectant, scouring powder and bowl cleaner—all of them slow-acting, one-purpose agents multiplying labor costs. Maintenance was using all 4 off and on . . . and getting nowhere.

"We approached the problem by demonstrating how much quicker SBS 50 will *clean, disinfect, sanitize* and *deodorize* fixtures, walls and floors in just one operation. This opened their eyes to SBS 50's effective 4-way action which eliminates duplication of labor, cuts housekeeping costs and creates a hygienic atmosphere employees respect and live up to."



Money-saving suggestions like this *begin* with OPERATION PINPOINT–a thought-provoking presentation filled with facts about skin hygiene and washroom maintenance. The SBS soap counselor serving your area can pinpoint the right soap to do every skin cleansing job best and at lowest cost in your plant. Let him show you OPERATION PINPOINT . . . just call your nearest SBS office, collect.

the washword of industry

SBS sugar beet products co.

SAGINAW, MICH. • Los Angeles, Calif. • Newark, N.J.
CANADA: Chemical By-Products, Ltd., Toronto, Ontario

For More Facts Write No. 262 on Information Card—Page 32

Association News

(*Continued from page 152*)

He said that all these fancy forms and procedures scared off the little fellow who thought he had to be "big" to get any value from such a program. "On a percentage basis," Mr. Pierce stated, "the little guy profits the most." He urged everyone to forget the idea that extensive programs, training, formulas, or other intricacies are necessary to be successful with value analysis. Large dollar savings, he observed, are the measurement of success.



Wilbur J. Pierce

Four-Step Program

Pierce outlined a four-step program for the application of value analysis principles:

(1) Determine function—What is the item requisitioned going to be expected to do?

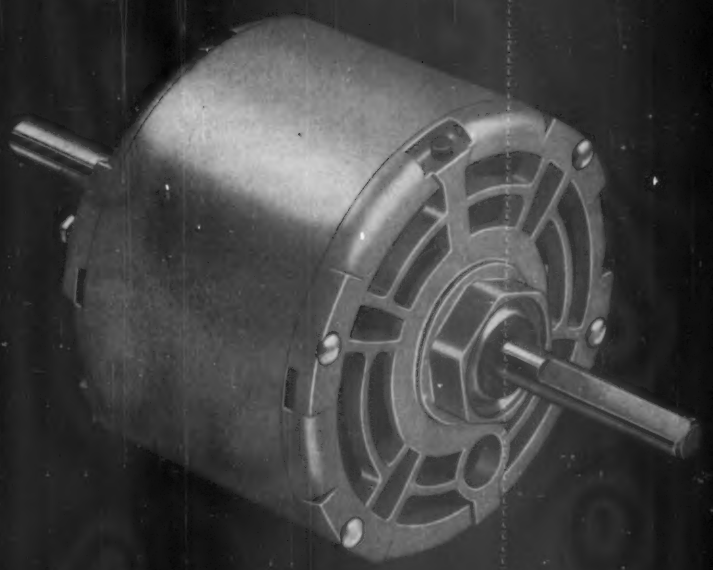
(2) Search for alternates—A knowledge of markets helps, but also ask any salesman or other buyers. Look at alternate materials and methods, always relating them to the function desired.

(3) Cost your plan—How much will the various items, materials, or methods cost. What is the cost relationship to functional need?

(4) Sell your proposal—When you've come up with a real value, selling to the requisitioner is easy.

Thomas H. Daley, Parker-Hartford Co., was general chairman of the conference for purchasing agents from the four local associations which make up the 9th District: Connecticut, Western Massachusetts, New England, and Rhode Island.

SPECIFY LEECE-NEVILLE MOTORS FOR QUALITY, RUGGED DESIGN, LONG LIFE



ECONOMY AND RUGGED STRENGTH—Model 6D Shaded Pole. 6 Pole —1050 rpm—1/12 to 1/4 hp. Quiet, smooth running power . . . ideal for air conditioning, refrigeration and heating service.



QUALITY ELECTRICAL EQUIPMENT
Leece-Neville
SINCE 1909

LEECE-NEVILLE now offers you a complete line of shaded pole and permanent split capacitor motors—basic units adapted to your specifications, or special motors custom engineered to your requirements —with horsepower ratings from 1/150 to 1/2 hp. All L-N motors are capable of meeting U.L. and C.S.A. application tests. Leece-Neville has more than 50 years of experience manufacturing motors and other electrical equipment, and modern facilities assure not only top quality, but also delivery to your schedules and lead times. For full information, just mail the coupon at right.

The Leece-Neville Company, Dept. P-12
Georgia Division, Gainesville, Georgia

Please forward details on your shaded pole and permanent split capacitor motors.

*Name*_____ *Title*_____

*Company*_____

*Address*_____

*City*_____ *Zone*___ *State*____

*Type of product*_____

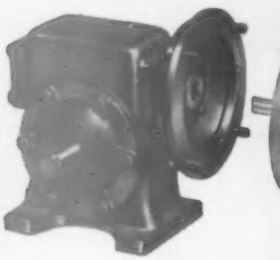
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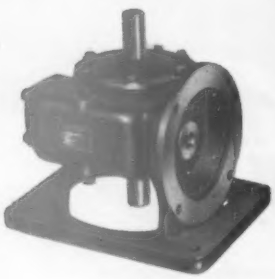
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motorized
speed reducers

available from stock

Yes! 956 different combinations of Perfection Motorized Worm Gear Speed Reducers are available for immediate delivery, *from stock.* Ratios range from 5 to 1 to 60 to 1, in capacities from 1/6 H.P. to 5 H.P. Perfection "C" Flange Reducers may be ordered complete with motor or without motor, to be used with a motor *of your own choice.*





Flanged motor reducers offer the maximum in compactness, rigidity and adaptability. Through the use of standard NEMA face mounted motors, complete interchangeability between motors is provided. Motor maintenance is possible without disturbing the drive and reducer. Motor assembly is fast and positive with no alignment problems.

Write for your free copy of our new 28 page catalog containing illustrations, charts and tables to help you choose the right Reducer for your particular application. Ask for Bulletin No. M-140.



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PERFECTION GEAR COMPANY, HARVEY, ILLINOIS

For More Facts Write No. 264 on Information Card—Page 32

Association News

Vasco Is Hot Subject In Pennsylvania

The October meeting of the Purchasing Agents Association of Northeastern Pennsylvania was dominated completely by value analysis and standardization.

The afternoon workshop was conducted by Larry Whitehouse, Morton Manufacturing Corp., 5th District chairman of the national committee.

Guest speaker at the evening meeting was M. E. Davis, of Spaulding Fibre Co. Members of the Lehigh Valley, Reading, and Central Penna. Associations joined with the Northeastern group for both the workshop in the afternoon and the dinner meeting in the evening.

At a previous meeting of the Association, members heard a talk by Paul V. Farrell, editor of PURCHASING Magazine, on the "Purchasing Agent and Management Team." Mr. Farrell explained the importance of the purchasing agent to the management team.

Officers of the Northeastern Association are: Arthur H. Dietze, Eberhard Faber, Inc., president; Ralph A. Lewis, Northeastern Bank & Trust Co., vice president; William R. Hughes, Sterling Hotel, secretary; George Malosh, Bittenbender Co., treasurer; David P. Dick, Trane Co., national director; Joseph Chismark, General Electric Co., education director; and T. J. White, Eureka Specialty Printing Co., publicity director.



"How's that for suction?"



The Chimp who turned out to be a Chump

Once, in a far-off tropic land, there lived a chimpanzee named Charlie. His home was a banana tree.

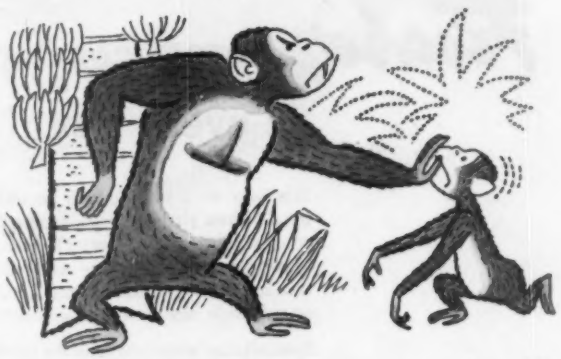
And you'll have to admit, that's a pretty shrewd place for a chimp to live.

One day Charlie spotted a huge bunch of ripe bananas, washed up on the beach by the incoming tide. He rushed from his tree and spent the next few weeks living a life of ease.

All too soon the treasure was gone.

Not only that, but Charlie found that his old tree had been taken over by an ape with large teeth and a nasty disposition.

So now Charlie squats sadly on the shore.



He peers anxiously towards the waves, waiting in vain for another treasure on another tide.

Whether your needs be bananas or steel, your safest, most reliable suppliers are right here at home. Remember, no one knows the needs of American steel buyers better than American steel makers. To serve you, and serve you well, is our primary concern—not just today and tomorrow—but year after year.

Isn't it reassuring to know the steel you buy is made by old and proven friends? It's steel of certified analysis, meeting appropriate specifications. You can rely on Bethlehem Steel for a wide range of standard and specialty products. And remember, our engineers are on call to help you solve your steel-working problems.

Isn't it time to place an order for your next steel requirement with Bethlehem?

Steel *for Strength . . . Economy . . . Versatility*

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

BETHLEHEM STEEL

For More Facts Write No. 265 on Information Card—Page 32



Fischer produces "specials" every day!

It's easy to mass produce precision turned nuts in odd sizes, shapes and threads . . . *AFTER years of specialized experience!* This capability also requires special machinery and advanced production methods to assure premium quality nuts and on-schedule deliveries at competitive prices.

Specializing in turned nuts for more than 30 years, Fischer has developed unique manufacturing and quality control techniques for precision nuts ranging from ⅛" to 1 1/16" in diameter. More than 3400 different types of "specials" . . . both brass and aluminum . . . already have been supplied for use in all types of products.

Write for Catalog FS-1000 and price lists.

Fischer nuts can help solve your fastening or assembly problems because each one is tapped square with face to Classes 2, 2-B and 3-B tolerances, countersunk both sides, furnished cleaned, burrless and ready to install.

there's no premium for precision at



Fischer

FISCHER SPECIAL MFG. CO.

471 Morgan Street • Cincinnati 6, Ohio

10008-FS

For More Facts Write No. 266 on Information Card—Page 32

Association News

Wisconsin Officials Hear Traffic Paint Report

Highlight of the recent meeting of Wisconsin Association of Public Purchasers was a report on traffic paint. Wayne E. Volk, state traffic engineer for Wisconsin, told the group, with words and slides, of the savings achieved by Wisconsin State Highway Commission.

Mr. Volk said performance tests and full competitive bids have helped to substantially reduce the cost of traffic paint and the labor necessary to get it on the road.

The Association also heard Clarence Nier, city attorney for Green Bay, discuss the "Legal Aspects of Public Purchasing."

The afternoon portion of the one-day meeting was a series of problem clinics devoted to the following subjects: purchase of trucks and other heavy equipment, athletic supplies, police cars, trees, salt and calcium chloride.

Orville A. Gartman, president of the Association and purchasing agent for the City of Oshkosh, presided at the meeting. Plans were announced for the next meeting to be held April 1961 in Milwaukee.

New York P.A.'s Hear Talk on Tension

Tension is normal in human beings. Only the pressure of too much tension or the problem of too little tension is difficult to live with. This was the message of Leonard Cammer, M.D., who addressed a recent meeting of the Purchasing Agents Association of New York on "Tensions in Everyday Living."

Religion, said Dr. Cammer, is one of the oldest value systems of man. It is the only one that explains why we exist. A hope and a prayer is one of the best reliefs against tension. If you want to get rid of tension, Dr. Cammer pointed out, you have to make a decision and take action. The action itself is not as important as tak-

(*Please turn to page* 160)

For More Facts About Ad on Facing Page Write No. 267→



100 of the leading gasket fabricators in the business

display this emblem . . . and one is near you. These widely experienced independent suppliers are staffed and equipped to give prompt, skillful attention to your gasket requirements. And each Approved Fabricator is backed by the quality products and extensive research facilities of Armstrong Cork Company, Industrial Division, Lancaster, Pa.

GOOD TIP

AMPCO®

FOR CUTTING SPOT-WELDING COSTS!



AMPCO-WELD® spot-welding tips are made of durable Ampco alloys with high electrical conductivity. They operate cooler — don't stick to the work. Resist mushrooming and wear. Need fewer dressings. Exceed RWAA minimum specifications. Ampco-Weld distributors have standard types *in stock.*

Write for catalog, price list, and name of your distributor.

AMPCO METAL, INC.

Department 377 L • Milwaukee 1, Wisconsin

WEST COAST PLANT: Huntington Park, California

SOUTHWEST PLANT: Garland (Dallas County), Texas

For More Facts Write No. 268 on Information Card—Page 32

Association News

(*Continued from page* 158)

ing the action, he said.

N.A.P.A. President Paisley Boney and Mrs. Boney attended the meeting as unofficial visitors. They were accompanied by G. W. Howard Ahl, N.A.P.A. Executive Secretary, and his assistant, Frank Winters.

Preceding the dinner meeting two forums were held. The general forum was sponsored by the Value - Analysis - Standardization Committee. Entitled "The Dollar Sign," it featured E. J. Duffy, Worthington Corp., speaking on "Organizing for Profit"; T. I. Burrows, Chas. Pfizer & Co., on "Policy and Procedure"; J. A. McAleer, General Electric Co., on "Market and Method Analysis"; and J. W. Hartung, St. Regis Paper Co., on "How to Begin Your Value Analysis-Standardization Program."

The Office Supply and Equipment forum featured a discussion of the new Haloid 914 copying machine.

Specialized Appliance Motors . . .



Single-stage worm gearmotor. Rolled thread on output shaft actuates traveling nut.

Show How Compact Design Can be Obtained For Your Product

For devices — vacuum cleaners, floor polishers, food mixers and the like — where it is important to obtain a compact, light-weight design, streamlined styling and favorable cost, a Lamb® specialized appliance motor will provide optimum results. May we demonstrate these advantages of Lamb motors for your new or redesigned products? Descriptive folder sent on request.

THE LAMB ELECTRIC COMPANY • KENT, OHIO

A Division of American Machine and Metals, Inc.

In Canada: Lamb Electric — Division of Sangamo Company Ltd. — Leaside, Ontario

Lamb Electric

SPECIAL APPLICATION FRACTIONAL HORSEPOWER **MOTORS**



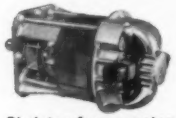
Parts for double-shaft floor polisher. Shaft has two rolled worms, right and left hand.



Nozzle agitator motor for use with canister-type vacuum cleaners. (Single coil field)



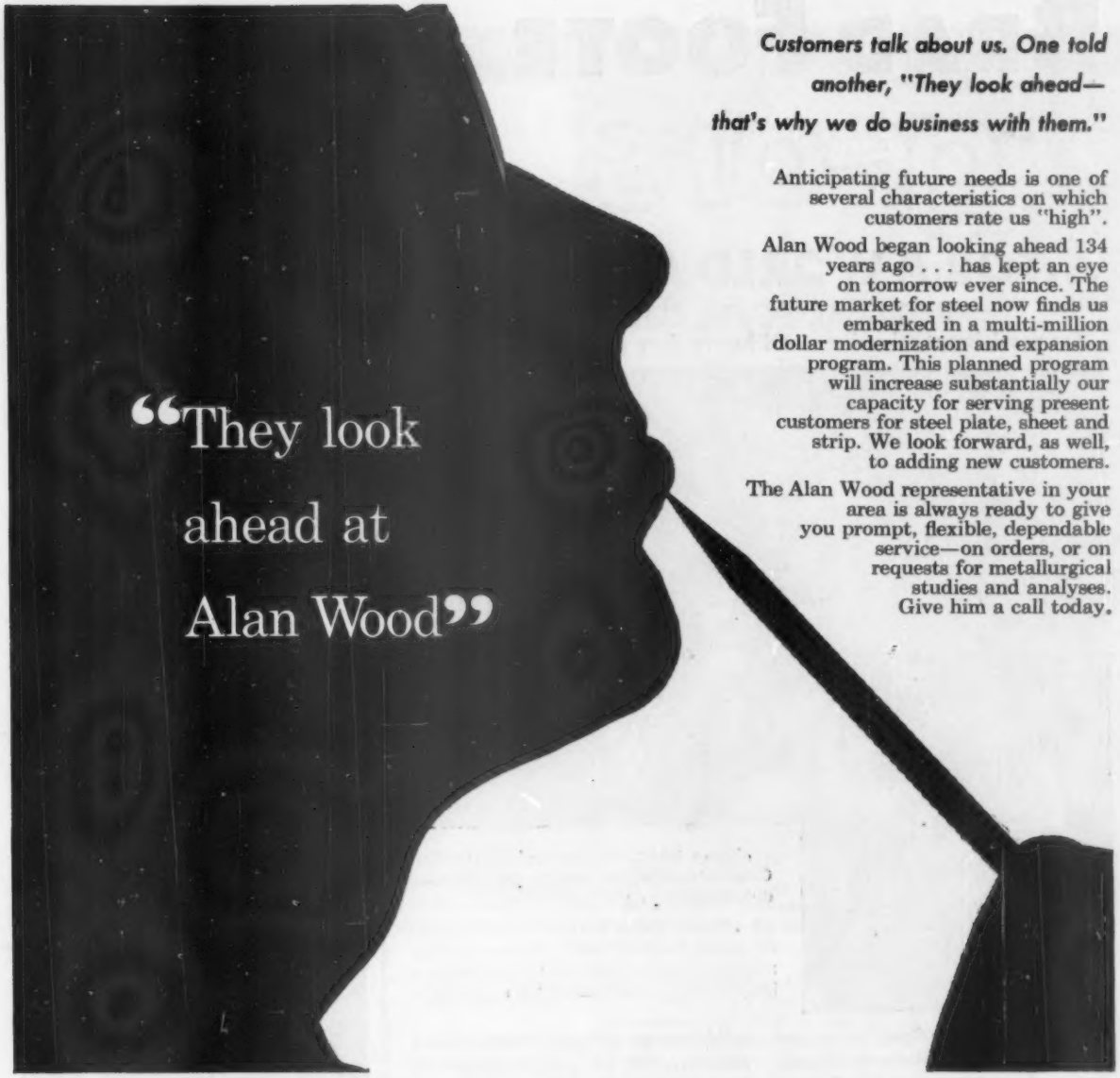
Custom-built motor and fan assembly for upright domestic vacuum cleaners.



Skeleton frame motor for vegetable juicer.

Divisions of American Machine and Metals, Inc., New York 7, N. Y. TROY LAUNDRY MACHINERY • RIEHLE TESTING MACHINES • DE BOTHEZAT FANS • TOLHURST CENTRIFUGALS FILTRATION ENGINEERS • FILTRATION FABRICS • NIAGARA FILTERS • UNITED STATES GAUGE • RAHM INSTRUMENTS • LAMB ELECTRIC CO. • HUNTER SPRING CO. • GLASER-STEERS CORP.

For More Facts Write No. 269 on Information Card—Page 32



Customers talk about us. One told another, "They look ahead—that's why we do business with them."

Anticipating future needs is one of several characteristics on which customers rate us "high".

Alan Wood began looking ahead 134 years ago . . . has kept an eye on tomorrow ever since. The future market for steel now finds us embarked in a multi-million dollar modernization and expansion program. This planned program will increase substantially our capacity for serving present customers for steel plate, sheet and strip. We look forward, as well, to adding new customers.

The Alan Wood representative in your area is always ready to give you prompt, flexible, dependable service—on orders, or on requests for metallurgical studies and analyses. Give him a call today.

ALAN WOOD STEEL COMPANY

Conshohocken, Pa. • **STEEL PRODUCERS WITH THE CUSTOMER IN MIND**

DISTRICT OFFICES AND REPRESENTATIVES: Philadelphia • New York • Los Angeles • Boston • Atlanta Cincinnati • Cleveland • Detroit • Houston • Pittsburgh • Richmond • St. Paul • San Francisco • Seattle Montreal, Toronto and Vancouver, Canada: A. C. Leslie & Co., Limited

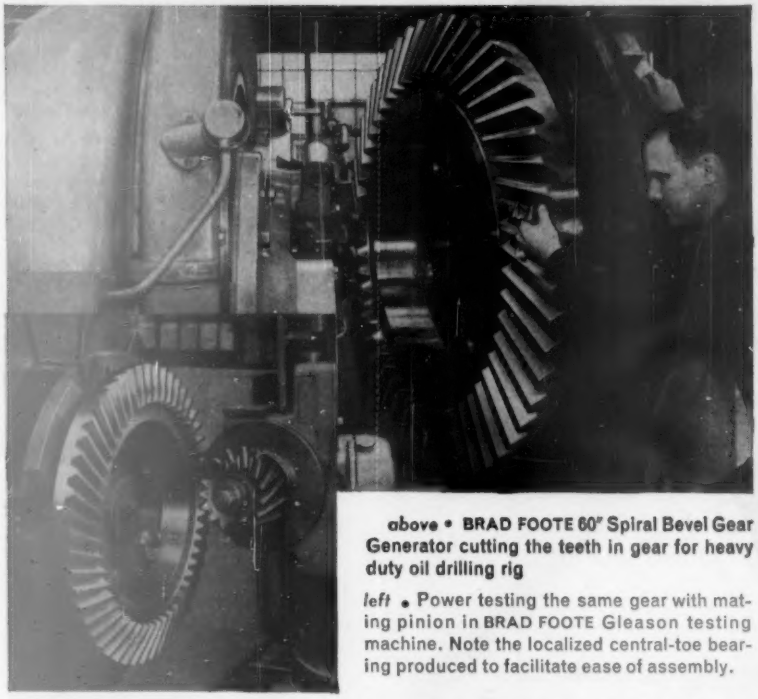


For More Facts Write No. 270 on Information Card—Page 32

BRAD FOOTE gears ...FOR A WORLD AT WORK

SPIRAL BEVEL GEARS

for precision mechanisms and heavy duty power transmission



above • BRAD FOOTE 60" Spiral Bevel Gear Generator cutting the teeth in gear for heavy duty oil drilling rig

left • Power testing the same gear with mating pinion in BRAD FOOTE Gleason testing machine. Note the localized central-toe bearing produced to facilitate ease of assembly.

BRAD FOOTE offers the finest cutting and testing equipment available for the production of precision spiral bevel gears in the widest range of capacities.

These include such diversified drives as: spiral, zerol, right angle, obtuse or acute angle. They may be in sizes from 1" to 60" diameter, 10 DP to 1 DP and from ½" face to 10" face.

For precision mechanisms or heavy duty power transmission, BRAD FOOTE builds your gears from blanks to finished product...fills all your requirements from *one source.*

ORDER FROM BRAD FOOTE

Your order for BRAD FOOTE Gears will be processed by an experienced organization of gear specialists and produced on the most extensive and versatile facilities available. Maximum performance and your complete satisfaction are assured because no one shares our responsibility.



OTHER BRAD FOOTE SPECIAL EQUIPMENT INCLUDES: High Precision Rack Broaching Machine with capacity up to 1 DP; 154" Precision Gear Shaper; 72" Diameter Shaving Machine

MEMBER OF AGMA

BRAD FOOTE GEAR WORKS, INC.

1311A South Cicero Avenue • Cicero 50, Illinois • Bishop 2-1070 • OLympic 2-7700

subsidiary • PITTSBURGH GEAR COMPANY, Neville Island • Pittsburgh 25, Pa., Phone: SPaulding 1-4600

For More Facts Write No. 271 on Information Card—Page 32

News

Purchasing Displays Products for Vendors

Lau Blower Co., Dayton, Ohio, is going all-out for value analysis. It recently invited 150 of its vendors to attend a three-hour meeting which featured a display of all the company's products. The hope is that from examination of these products Lau vendors will be able to come up with some value analysis cost reduction ideas.

Lau President T. I. Byrd, in explaining the reason for the product exhibit, said:

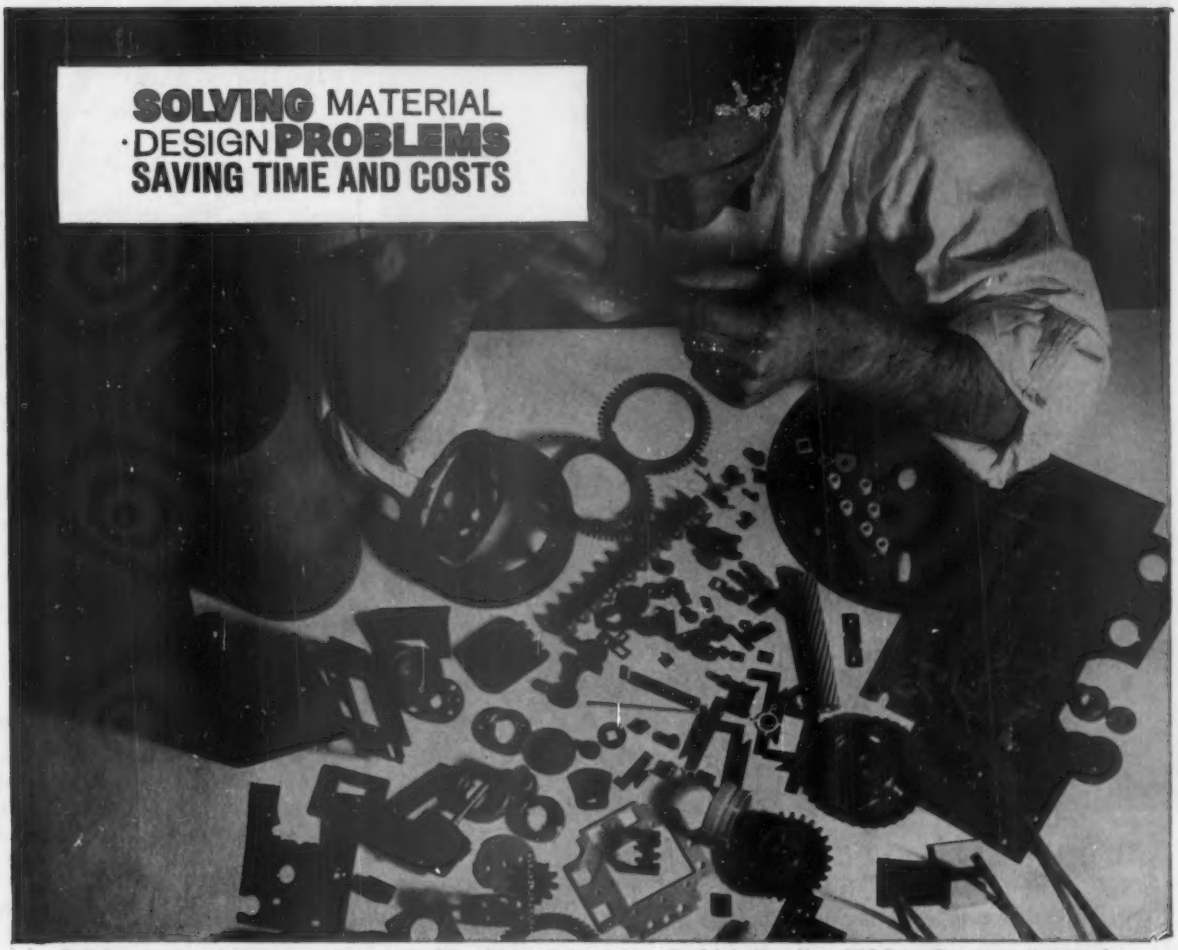
"We spend more money each year purchasing raw materials, parts, and components than in any other phase of the business —including our labor costs. Since this amounts to several million dollars, we wanted our suppliers to see our overall needs, make recommendations, and assist us with new and better ideas."

During the display, major products were stripped down to the last nut and bolt. Suppliers and key personnel from Lau discussed and evaluated the various parts.



Suppliers of Lau Blower Co. crowd around displays of the company's products. Purpose of the Lau exhibit was to stimulate vendor value analysis suggestions.

"We will not know the full effects of this meeting for some time," Byrd says, "but we believe that it is a major step to secure the best materials and components for use."



Reliable plastic components are the result of the right material plus quality fabricating. Your CDF Sales Representative may be able to help you both ways.

Helping you turn out a better product and saving you production time and costs are basic functions of the CDF Sales Representative.

He can recommend the correct industrial plastics material to meet your requirements because he offers a line of more than two hundred grades . . . the most complete available. He's experienced in plastics problem-solving for every type of industry.

He can also tell you about other CDF services. One is fabrication of plastic parts to your specific requirements. CDF facilities, for practical purposes, become an extension of your own production lines. Another service is CDF's in-plant technical assistance.

If you have a problem in plastics, your CDF Sales Representative is a good man to see.

CONTINENTAL-DIAMOND FIBRE

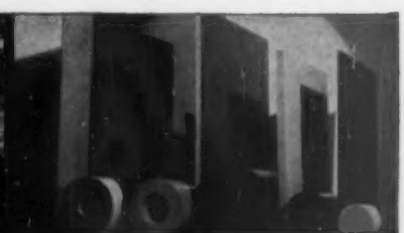
A SUBSIDIARY OF THE Bird COMPANY • NEWARK 41, DEL.
In Canada, 46 Hollinger Road, Toronto 16, Ont.



In-plant technical assistance is always available. CDF Applications Engineers will work with your design and production people . . . help you solve problems involving plastics.



Extensive CDF fabricating facilities for machining, molding, and forming plastic parts to your own specifications. The most modern equipment and experts in fabrication are ready to handle any size order.



The widest selection of industrial plastics comes from CDF. The line includes epoxies, phenolics, copper-clad laminates, as well as vulcanized fibre and Micabond. They offer a variety of properties and uses.



when buying custom molded plastics

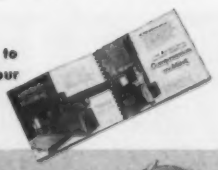
The unit cost of a molded plastic part does NOT tell the entire story . . . nor should it be the sole factor in your selection of a custom plastic molder.

Specifying Aico-molded plastics not only assures you of a reasonable unit cost, but will provide a priceless bonus in Aico's fully integrated molding service . . . a service that eliminates split responsibilities and assures delivery deadlines that are respected.

AICO offers all users of custom molded plastics a completely dependable service with unmatched experience and coordinated facilities for Engineering, Mold Building, Compression, Transfer, Plunger, Injection and Cold Molding . . . plus the molding of Reinforced Fiberglass.

look to AICO for custom molded plastics

Send for AICO's FREE Facilities Booklet. It's a valuable guide to the selection of a Custom Plastics Molding Service to meet your requirements.





AMERICAN INSULATOR CORPORATION
NEW FREEDOM, PENNSYLVANIA

News

See Four-Day Week, Five Days' Pay

At our present rate of productivity, a four-day week at five days' pay will probably become the general rule in about ten years, says Alan C. Filley, assistant instructor at Mansfield Extension of Ohio University.

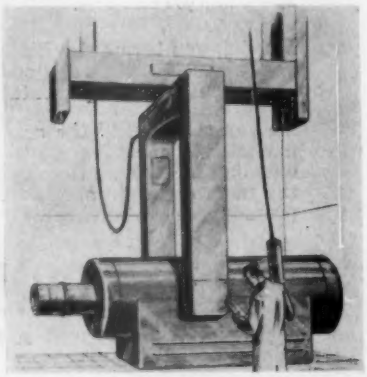
As a result of this, Filley says, there will be a further increase in "moonlighting". The increase in the size of American families and the drive for a higher scale of living are the major reasons stressed by workers in taking secondary jobs.

According to Filley, there is strong opposition to moonlighting by labor unions. Reasons: it thwarts their objective of work-snaring and many secondary jobs pay less than the union scale.

X-Ray Machine Designed For High-Speed Operation

The world's most powerful X-ray machine specifically designed for high speed radiography in the metals industry will be installed in the A. O. Smith Corp. Milwaukee plant next spring.

This eight million-electron-volt linear accelerator is being built

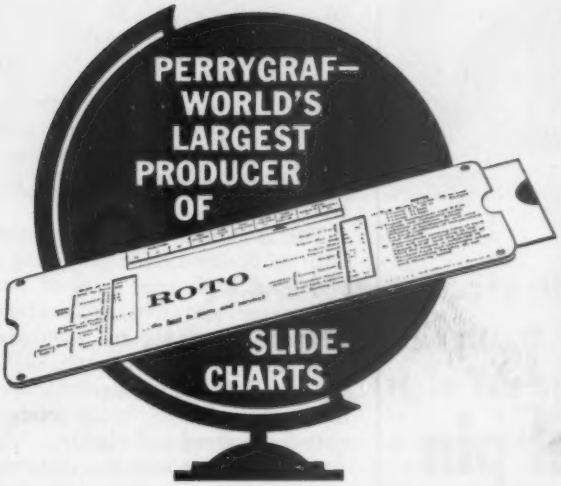


A. O. Smith Corp.'s mammoth X-ray machine will be used to check the soundness of large metal structures. The unit can "see" through steel more than a foot thick.

by High Voltage Engineering Corp., Burlington, Mass. Known as the "Linac", it is designed to "see" through steel more than a foot thick and to provide a photo-

(*Please turn to page* 166)

For More Facts Write No. 272
←on Information Card—Page 32



Two hundred million since 1932! More Slide-Charts for more people than any other company in the world.

Two Modern Plants, one geared to runs of millions, the other to hundreds. Finest facilities for accurate printing and assembly. **Deliveries** as high (in a pinch) as a million per week. **Prices** consistent with quality work and dependent on quantity and materials from pennies to dollars.

We invite your inquiry. Send for free full color booklet including 122 actual case histories.

PERRYGRAF *slide-charts*

product facts at the fingertips

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1500-I Madison St., Maywood, Ill.

For More Facts Write No. 273 on Information Card—Page 32

ROTARY AIR **GAST** PRODUCTS



Six sizes . . . all variable speed, explosion-proof

GAST AIR MOTORS

Need compact, low cost power? For plant use and original equipment applications, Gast rotary-vane Air Motors offer these distinct advantages:

1. Explosion-proof power. No danger!
2. Low initial cost per rated h.p.
3. Variable speed with valve control.
4. Can't burn out from overloads.
5. Vanes take up their own wear.
6. Reversible rotation (opt.) 5 sizes.
7. Very compact — light in weight.
8. Top-quality ball-bearing design.

TYPICAL PERFORMANCE

Model No.	H.P. at 90 PSI 2000 RPM	Weight lbs.
1AM	0.13	1½
2AM	0.57	5½
4AM	1.1	8
6AM	2.0	17
8AM	4.0	25
16AM	7.0	65

Gast Manufacturing Corp.
P. O. Box 117-X
Benton Harbor, Mich.

Write for Bulletins — specify models!

GAST ROTARY
• AIR MOTORS TO 7 H.P.
• COMPRESSORS TO 30 P.S.I.
• VACUUM PUMPS TO 28 IN.
"Air may be your answer!"

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CORBIN EXCLUSIVES

ECONOMY APPEARANCE UTILITY

Smart!
NEW DESIGNS
LEVER HANDLES SERIES 1000
TEE HANDLES SERIES 1001



Patent Applied For

WITH LOCKING MECHANISMS

•

WITHOUT LOCKING MECHANISMS, OPERATING

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WITHOUT LOCKING MECHANISMS, RIGID

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May Be KEYED ALIKE, DIFFERENTLY OR MASTERKEYED

Exclusive!
CORBIN attaching CLIP



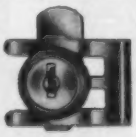
U.S. Patent 2948141

AVAILABLE ON CCL CAM AND METAL DESK LOCKS

•

SPRING STEEL CLIP FEATURES

- FAST APPLICATION
- POSITIVE HOLDING
- CAN'T TAKE PERMANENT SET



JUST SNAP ON AND JOB'S DONE

Famous!
CORBIN SESAMEE COMBINATION LOCKS
SECURITY PLUS CONVENIENCE

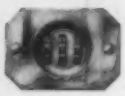


#440 BOX LOCK
COMBINATION CHANGEABLE AT WILL

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FOR
- CARRYING CASES
- TOOL BOXES
- CASH BOXES
- MEDICINE CHESTS

and other uses



#441K WITH RECESSED FRONT PLATE

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Other SESAMEE PADLOCKS, LUGGAGE LOCKS

Variety

Many other types of locking devices, over center, 3 point catches and kindred items.

Service

Call on us for recommendations and solutions to application problems.

CORBIN

CORBIN CABINET LOCK DIVISION
THE AMERICAN HARDWARE CORPORATION
NEW BRITAIN CONNECTICUT

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ALLEN

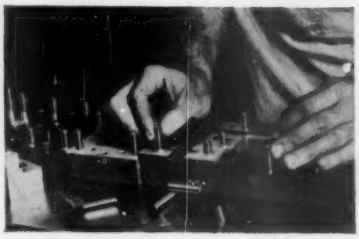


ALLEN is the dowel pin that gives you PLUSES!

Your ALLEN Industrial Distributor can show you a good many ways to use ALLEN Dowel Pins, in addition to conventional uses in tool and die work. You can use them as economical roller bearings, axles, precision plugs, hinge and wrist pins—and in many other ways.

You can cut the cost of your product substantially, too—because your ALLEN Distributor can supply these strong, accurate, mirror-finished Dowel Pins in standard sizes right from stock.

Made of special Allenoy steel; surface hardened to 62-64 Rockwell C; precision ground to .0001" with micro-inch finish of 6 RMS max. Check your Allen Handbook or Catalog for detailed specs and standard sizes, or write direct for samples and technical information.



Genuine ALLEN products are available only through your ALLEN Distributor—he's always ready, willing and able to give you prompt, practical service.

50 ANNIVERSARY YEAR ALLEN HEAD 1910-1960

ALLEN MANUFACTURING COMPANY

HARTFORD 1, CONNECTICUT, U.S.A.

For More Facts Write No. 276 on Information Card—Page 32

News

(*Continued from page* 164)

graphic check on the soundness of metal structures—including core barrels for nuclear reactors and high pressure vessels for the petrochemical industry.

The machine will be equipped with an X-ray source providing a choice of focal spot sizes of one millimeter and five millimeters. Respective outputs are 1500 and 6000 Roentgens per minute, making possible the radiographic examination of very thick metals with both speed and clarity.

At full power and at a distance of nine feet, the five-millimeter focal spot source will X-ray an 11-inch thickness of steel in about one minute. The one-millimeter focal spot source provides even greater clarity, radiographing eight inches of steel in about one minute.

In operation, the "Linac" operating head will be suspended from an overhead crane which makes it possible to raise the unit from floor level to a height of 16 feet. It can be tilted to point its beam vertically downward or it can be rotated 45 degrees upward.

See Consumers Attitudes As Recession Brake

Because of the conservative attitudes and behavior of consumers, Americans can expect only "short and mild" recessions during the next few years.

So says Dr. George Katona of the University of Michigan Survey Research Center. He made his prediction during the university's eighth annual Conference on the Economic Outlook at Ann Arbor, Mich.

The present decline in business activity is "fundamentally different" from 1957, he said. "We don't have a sharp, deep downturn as in 1958 in the offing."

In 1957, there was widespread resentment against price increases and concern about higher interest rates, Katona noted. But in recent months, he added, consumer sentiment has moved sideways rather than declining further—as it did during the summer and fall of 1957.

Quiet...



WAGNER Polyphase Resilient Mounted Motors in ratings through 10 horsepower

Quiet, vibration-free performance is essential when motors are installed in areas where noise must be held to a minimum . . . in hospitals, churches, schools, office buildings, restaurants and similar locations where quiet is needed or wanted.

Such installations have created a need for larger polyphase motors that whisper while they work. Wagner has met this need by expanding its line of polyphase resilient mounted motors to include standard ratings through 10 hp.

You certainly have applications that call for a smooth running motor, cushioned by resilient mountings. To make sure they're quiet, specify Wagner Polyphase Resilient Mounted Motors. Only Wagner can provide an entire range of ratings through 10 hp.

Constant research and development have kept Wagner up front in electric motor design for more than 65 years . . . made the name Wagner one you can depend on in choosing electric motor drives.

Your nearby Wagner Sales Engineer can help you select the right motor to meet your requirements. There are Wagner branch offices in 32 principal cities.

Wagner Electric Corporation
6360 PLYMOUTH AVENUE, ST. LOUIS 33, MISSOURI

WM60-14



SLEEVE OR BALL BEARING
These motors are furnished with quiet running steel-backed babbitt-lined sleeve bearings of high load carrying capacity. Ball bearings can be supplied when desired.





CEILING, SIDEWALL OR HORIZONTAL MOUNTING
You can mount these motors on walls or ceilings by rotating the cradle base 90° or 180°. Motor stays dripproof.



NEOPRENE CUSHIONING RING
Annular mountings, of oil-resistant neoprene bonded to steel rings, cushion the motor in its cradle base to absorb the small amount of vibration that remains in the most carefully balanced motor.

For More Facts Write No. 277 on Information Card—Page 32

LENOX ANNOUNCES MAJOR BAND SAW BLADE ADVANCEMENT!

New Lenox Master-Band is proving to outlast at least three regular bands . . . cuts 50% faster . . . top performance on both standard and automatic cut-off machines.

The new Lenox **Master-Band** will definitely put new life and more versatility into your standard band saw machine. **Master-Band** will cut 50% faster . . . cut more square inches of metal . . . cut many of the tougher alloy steels on standard equipment . . . **Master-Band** will *outlast at least three regular metal cutting bands.*



THE Master-Band IS SUPERIOR! Special steel analysis of **Master-Band** results in a greater quantity of carbides in the structure. Processed by the Lenox modern, skillful heat-treating, **Master-Band** assures superior wear resistance, highly extended fatigue resistance, and continuous cutting of tougher steels at faster rates.

FOR ALL TYPES OF EQUIPMENT. The Lenox **Master-Band** is designed and engineered for use on *both* conventional and automatic cut-off machines . . . standard horizontal and vertical cutting band saw machines such as Kalamazoo, Johnson, Wells, DoAll, Marvel, Grob, Laidlaw, and others; and automatic cut-offs as DoAll, Marvel, Milband-Thompson, Peerless, Wells, Kalamazoo.

COST ADVANTAGES include: faster rate of cutting; less costly downtime; cutting tougher steels on standard equipment.

PROVE TO YOURSELF that the new **Master-Band** modernizes your cutting operation and decreases costs. Fill out the coupon below and mail today. Or see your industrial distributor.

LENOX
THE TOOLS IN THE PLAID BOX

AMERICAN SAW & MFG. CO.
SPRINGFIELD, MASSACHUSETTS, U.S.A.

Please RUSH me the facts on MASTER-BAND.
COMPANY _____
(TYPE OR PRINT)
ADDRESS _____
(STREET & NO.)
_____
(CITY) (ZONE) (STATE)
IMPORTANT! PLEASE COMPLETE
MATERIALS AND SIZES CUT MOST _____
_____
MAKE AND MODEL MACHINE _____
MY INDUSTRIAL DISTRIBUTOR IS _____

For More Facts Write No. 278 on Information Card—Page 32

Purchasing People

(*Continued from page* 55)

Dana Corporation, Toledo, Ohio has announced the appointment of **Norman W. Kimmel** to the corporate manufacturing staff as director of purchasing and production control. He has been plant manager of the company's Fort Wayne, Ind., division since 1953. Prior to becoming manager of the division, he served successively as special assistant to the plant manager, plant superintendent, and assistant plant manager. Before that Mr. Kimmel was with International Harvester, and the old Studebaker Corporation.



Norman W. Kimmel

The appointment of **Neal H. Hutchison** as director of purchases for the **Cleveland Division** of the **Midland-Ross Corporation, Cleveland, Ohio,** was announced. Mr. Hutchison succeeds the late **Howard Lemmerman.** The new director of purchases joined the former Midland Steel Products Company in 1937 in the cost department. Since then he has been assistant controller, administrative cost controller, and, most recently, staff assistant to the vice president.

George H. Cassidy became purchasing agent of the **Westinghouse Portable Appliance Division, Mansfield, Ohio.** In the newly created position he will be responsi-

(*Please turn to page* 170)



ANNOUNCING A NEW SERVICE FROM 3M FOR USERS OF COATED ABRASIVES

3M has initiated a unique service program to meet industry's desire to be kept fully informed of the new materials and new methods in the use of coated abrasives.

This 3M program—"Cost Check 5-4-5"—offers manufacturers expert analysis and study of their grinding, finishing and polishing operations in the light of current technological advances in this vital area. As a result, many procedures and methods may be improved at a significant cost saving.

The efficient use of coated abrasive tools is closely related to their economical purchase, a factor of utmost importance to you. For this reason you may wish to learn more about the way 3M's "Cost Check 5-4-5" program is serving industry. Ask your 3M Representative to show you this program or write: 3M Co., 900 Bush Ave., St. Paul 6, Minn.

3M COATED ABRASIVES

MINNESOTA MINING AND MANUFACTURING COMPANY
...WHERE RESEARCH IS THE KEY TO TOMORROW

3M COMPANY

For More Facts Write No. 279 on Information Card—Page 32

ASSEMBLY or MAINTENANCE
BIG or SMALL
Snap-on®
HAS THE RIGHT SOCKET FOR YOU

SNAP-ON makes over 1,000 sockets in a wide variety of sizes and types. Your SNAP-ON industrial representative can give you full details.

FOR ALL INDUSTRY
SNAP-ON TOOLS
8019-L 28th AVENUE • KENOSHA, WISCONSIN
For More Facts Write No. 280 on Information Card—Page 32

Purchasing People

(*Continued from page* 168)

ble for the Division purchasing. He will also coordinate purchasing department activities of the division's plant at East Springfield, Mass. Mr. Cassidy joined Westinghouse as a purchasing de-



George H. Cassidy

partment clerk in Mansfield in 1943. Since then he has been buyer, supervisory buyer, cost coordinator and production supervisor. He is a graduate of Ohio State University, and a member of the North Central Ohio Purchasing Agents Association.

Harry P. Rosen has been made manager of purchases for **Pacific Semiconductors, Inc., Lawndale, Calif.** Mr. Rosen holds a degree in optometry from the Northern



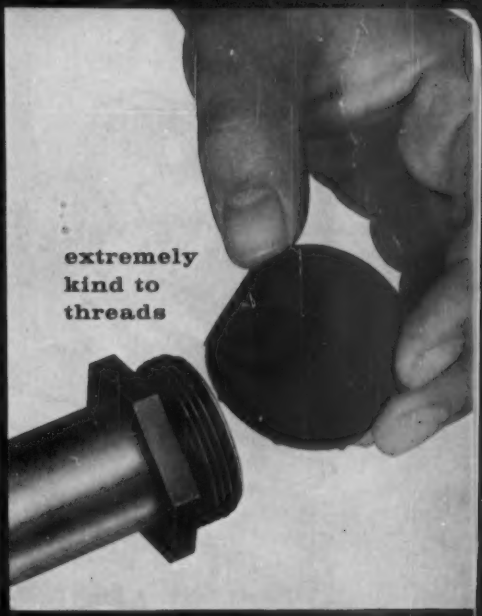
Harry P. Rosen

Illinois College of Optometry and also attended the University of Illinois.

For More Facts About Ad on Facing Page Write in No. 281→



can save you hundreds $$$
for pennies spent



extremely
kind to
threads



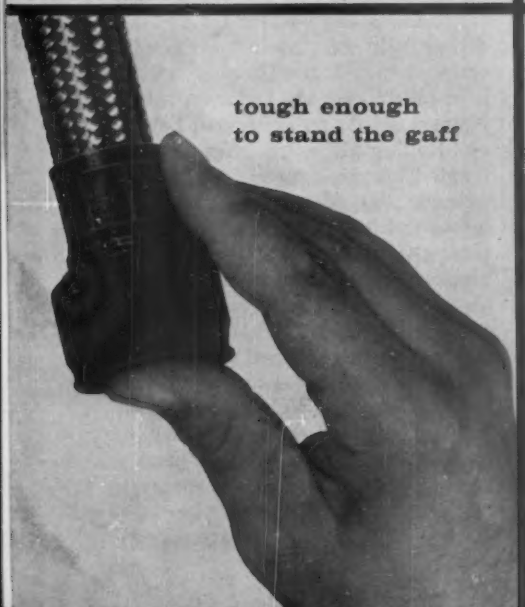
easy to apply
...and remove



molded of flexible
Polyethylene

Caplugs

now in stock: over
600 sizes in numerous
styles and colors.



tough enough
to stand the gaff



won't chip,
break, shred
or collapse

snug-fitting closures to meet almost any need you can name... get a kit full of samples in exchange for the coupon below.

CAPLUGS DIVISION,
PROTECTIVE CLOSURES CO., INC.
2201-5 Elmwood Ave., Buffalo 23, N.Y.

MAIL a free assortment of Caplugs, literature and prices to us, without obligation.

Name

Title

Firm

Address

City Zone State



THERE'S A BETTER APPROACH TO PLANT MAINTENANCE OPERATIONS!

Seriously, many a shop is performing maintenance metalworking operations the hard way. Below are two suggestions to help break this bottleneck present in many a factory:

'BUFFALO' UNIVERSAL IRON WORKER — the all-in-one metal fabrication machine that cuts, punches, miters, shears, slits, copes and notches all standard metal shapes without changing tools — does all standard operations in the time and space usually required by 6 single-purpose machines. Write for Bulletin 322.

'BUFFALO' DRILLING MACHINES such as this well-known "RPMster" which adjusts so rapidly that it performs job drilling at production speeds. 1001 instantly adjustable spindle speeds mean real setup time savings on hundreds of varied jobs during an 8-hour shift. Quality 'Buffalo' ball bearing spindles mean accurate work. This machine — and a dozen other types of 'Buffalo' Drills — are paying their way in every type of production and maintenance drilling operation. Write for 'Buffalo' Bulletins covering the type of work you do. Remember — the P.A. has a major role in channeling money-saving ideas to all departments.



See 'Buffalo' Machine Tools in Operation . . .
MACHINE TOOL SHOW—Booth 551

MACHINE TOOL DIVISION
BUFFALO FORGE COMPANY
Buffalo, New York
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

ESTABLISHED 1877 "Buffalo" MEMBER NMTBA



Buffalo air handling equipment to move, heat, cool, dehumidify and clean air and other gases.



Buffalo Centrifugal Pumps to handle most liquids and slurries under a variety of conditions.



Buffalo Machine Tools to drill, punch, shear, bend, slit, notch and cope for production or plant maintenance.



Squier machinery to process sugar cane, coffee and rice. Special processing machinery for chemicals.

For More Facts Write No. 282 on Information Card—Page 32

Industry



Corning Glass Works has announced plans to build a plant at **Danville, Va.**, for the manufacture of a wide range of specialty glasses. Construction has started on an 89-acre site. Manufacturing will begin early in 1962.

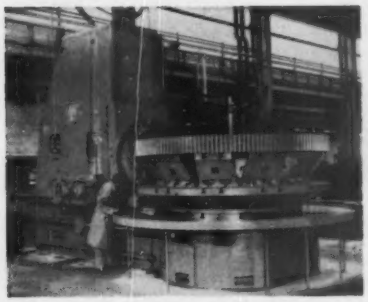
The plant will have 190,000 square feet of floor space and initially will employ about 200 persons. It will be operated by the company's technical products division. Products will include a 96% silica glass used for laboratory apparatus and industrial equipment, a number of glasses in tubing and sheet for technical applications, and several glasses used in the electronics industry.



Electronically welded copper tubing, the first to be produced commercially in the United States, is in production at **Tubotron, Inc., Newark, N. J.**, an affiliate of Eastern Rolling Mills, Inc., New York City. The high-speed operation extends the advantages of electronic welding to copper and brass tubing. Until now copper's 100% electrical conductivity has defied electronic welding. The high-frequency process at Tubotron, with a power capacity equal to that of three average television stations, now makes such welding possible on a commercial scale. This technological advance, the company says, gives Tubotron the capabil-

ity to offer tubing with many advantages over extruded and drawn tubing, including closer gauge tolerances and significant cost savings.

Equipment now installed will make tubing with outside diameters from ½ to 3½ inches and with wall thicknesses from .017 to .140 of an inch. In addition to copper and brass tubing, the company can produce electronically welded tubing, round and shaped, from all other metals including the exotic alloys.



The **Philadelphia Gear Corp.** has installed a new precision gear hobber in its recently constructed plant at **King of Prussia, Pa.** The new machine is suitable for hobbing gears up to 150″ in diameter and 64″ in face width, and is accurate to 10 arc seconds.



The Worthington Corporation, Harrison, N. J. will expand production facilities at its air conditioning plant in Decatur, Ala. A 90 thousand square foot extension will be added to the existing 170 thousand square foot facility.

Products presently manufactured at the Decatur plant include packaged air conditioners for commercial installations, air handling units for larger industrial buildings, evaporative condensers, coils and packaged chillers.

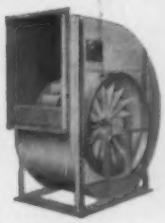


Looking for a Better Way to Handle AIR?

First step in selecting the best air handling equipment for the job is to pick the right manufacturer.

1. **Does he have a complete enough line?**
2. **Does he make a quality line?**
3. **Does he maintain nationwide service?**
4. **Facilities for engineering and manufacturing for special applications?**
5. **Reputation — years in business — satisfied customers?**

On all five counts, 'Buffalo' offers you a better way to handle air. Quality fans of every type and size, from propeller fans to giant centrifugal fans. A large factory and field Engineering Organization to help you at any time — competently. Facilities to design and manufacture any special-purpose equipment you may require. Finally, an 83-year reputation for excellence of product performance in the field.



Call your nearby 'Buffalo' Engineering Representative about your air handling problem. See what we mean by a "better" way.

Buffalo

BUFFALO FORGE COMPANY
Buffalo, New York
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.



Buffalo air handling equipment to move, heat, cool, dehumidify and clean air and other gases.



Buffalo Machine Tools to drill, punch, shear, bend, slit, notch and cope for production or plant maintenance.



Buffalo Centrifugal Pumps to handle most liquids and slurries under a variety of conditions.



Squier machinery to process sugar cane, coffee and rice. Special processing machinery for chemicals.

For More Facts Write No. 283 on Information Card—Page 32

GIVE YOUR PRODUCT A PLUG... WITH PULL!



This unusual cord set — introduced and patented by Miller Electric — is specified as the **finishing touch** by America's best known manufacturers.

Imaginatively designed to simplify and speed removal from any outlet, the trim, modern **Finger-Pull Plug** overcomes "wire yanking" habits that cause annoying and dangerous failures in ordinary plugs.

Cord can be hanked through loop. Dealers like to demonstrate it. Customers like to use it. You'll like its unlimited color co-ordination possibilities and the way it can effectively display your trademark. Styles available for light and heavy duty and 3-wire applications.

You get even **more** of a competitive advantage from cost-conscious Miller Electric's complete engineering service for problem applications, extremely efficient production and respect for your production schedules.

Whether from the industry's broadest line of stock cord set components or custom-engineered, Miller gives your product a "plug".

Write for Catalog P2

MILLER ELECTRIC CO.

120 Main Street • Pawtucket, R. I.

For More Facts Write No. 284 on Information Card—Page 32

Industry

Brummer Seal Company, Chicago Heights, Ill., manufacturer of mechanical seals for automotive engines, water pumps and other application, has been acquired by the spring division of **Borg-Warner Corp.** The company will be known as the Brummer seal division of Borg-Warner and will be operated as part of spring division. Operating personnel at the Chicago Heights plant is expected to remain largely unchanged.

The **Synthane Corp.** California division in **Glendale, Calif.**, has expanded its warehouse facilities with a fully-equipped fabricating service. The company has installed machinery for punching, drilling, shearing, turning, boring, milling and other fabrication of laminates. Synthane industrial thermosetting laminated plastics are used in the electronics, electrical, aviation, missiles, power, automotive and other industries.

STOP RUST

WRAP-UP
50% SAVINGS
WITH VPI WRAP

No more greasing your metal parts or products—this proven method stops rust completely with vapor from remarkable VPI WRAP. You save up to 50% on materials and labor and valuable production space, too. Learn how other companies have saved by modernizing their preservation methods.



SEND FOR THE NEW 16 page illustrated booklet on VPI WRAP. It's **FREE** and easy to read in breezy cartoon style. And best of all it tells a story that will save you time and money.

Write Dept. PM120

Ludlow

LUDLOW PAPERS, NEEDHAM HEIGHTS, MASS.
A Division of Ludlow Corporation

For More Facts Write No. 285 on Information Card—Page 32

SAW HOLES *Through Sheet or Plate!*



With a **MARVEL No. 1** Hole Saw Kit, you can save time and labor by sawing holes from ¾" to 2½" diameter in sheet or plate, using an ordinary portable electric drill or a drill press. Saws to cut holes from 9/16" up to 6" dia. are available. MARVEL High-Speed-Edge Hole Saws are heavy duty tools, having a cutting edge of high speed steel welded to a tough alloy steel body to insure fast cutting and long service life. Arbors are heat treated, rugged, and practically indestructible. No. 1 Kit is complete with ¾", ⅞", 1⅛", 1⅜", 1½", 1¾", 2", 2¼", 2½" Saws with necessary Arbors. See your MARVEL Distributor, or write for Hole Saw Bulletin HS-475.

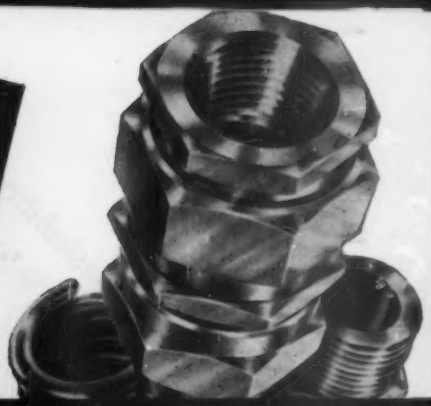
ARMSTRONG BLUM MFG. CO.
5700 W. Bloomingdale Avenue • Chicago 39, Illinois

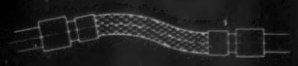
For More Facts Write No. 286 on Information Card—Page 32

For More Facts About Ad on Facing Page Write in No. 287→

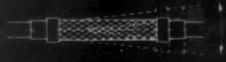
Flexonics PMS

NEW, BETTER WAY TO SOLVE ANY PIPE MOTION PROBLEM

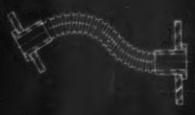




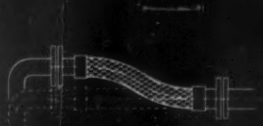
Solving shock motion and misalignment on drop forge.



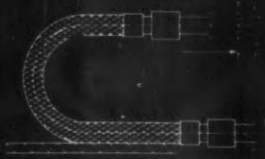
Preventing valve damage, vibration stress on compressor.



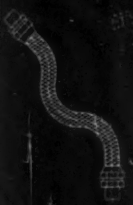
Solving piping space problem on de-waxing filter.



Correcting for thermal growth on coke oven gas connectors.

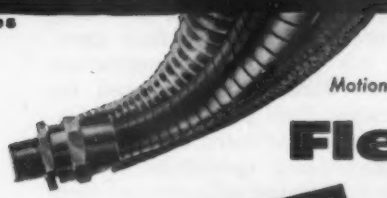


Correcting for reciprocating motion on single platen press.



Correcting for random motion on asphalt feed-line.

IH306



For expert service on all Pipe Motion Problems call your authorized

Flexonics PMS SPECIALISTS

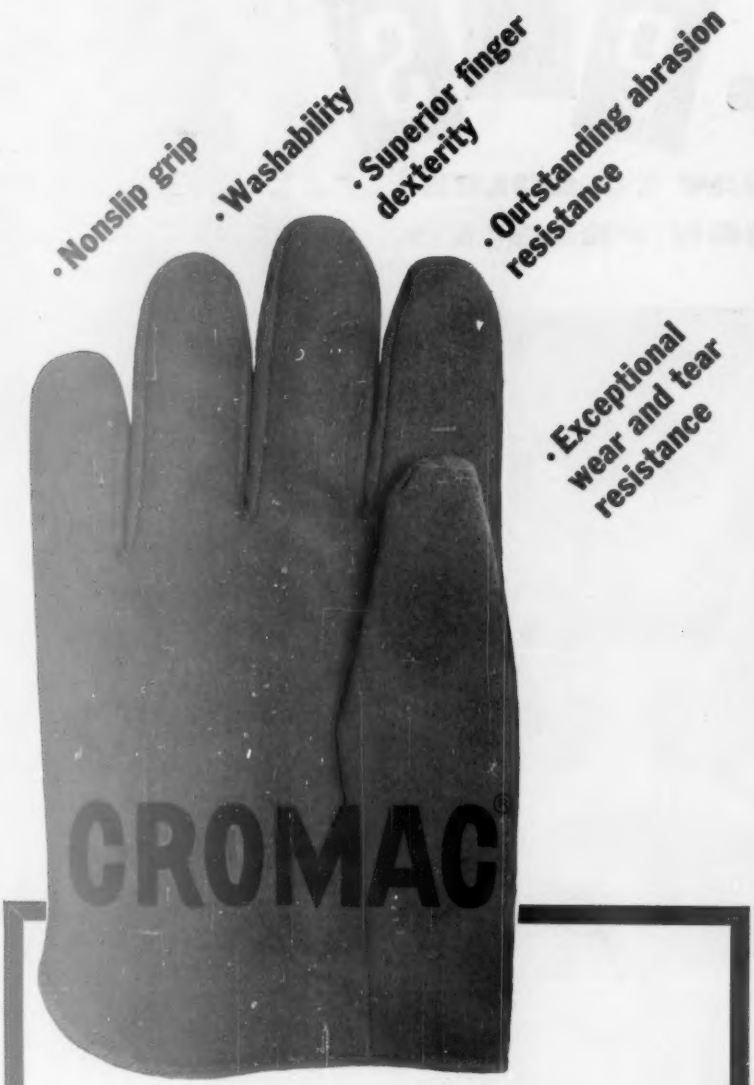
The one sure way to receive expert counsel on any *pipe motion problem* is to call your Flexonics PMS distributor. He is thoroughly experienced in all flexible metal hose applications. Let him analyze your need and make recommendations. He carries a broad metal hose inventory . . . has the facilities for fabricating *complete assemblies* to your specifications. This means *quick* . . . responsible service from one *local* source. Find him in your telephone directory under "Hose" or "Hose, Metal". . . or write

Flexonics corporation

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SUBSIDIARY OF CALUMET & HECLA, INC.

In Canada: Flexonics Corporation of Canada, Ltd., Brampton, Ont.



NEW!

Plastic-impregnated Cromac® gloves by Jomac that give unique 5-point glove performance

FREE SAMPLE PAIR will convince you . . . Cromac gloves by Jomac are all we say they are and more. Write Department F, Jomac Inc., Philadelphia 38, Pa.

JOMAC

"Jomac Sells Quality . . . and Quality Sells Jomac!"

For More Facts Write No. 288 on Information Card—Page 32

Industry



Ohio's largest industrial lift truck sales and service center will be erected by the **Yale & Towne Manufacturing Co., Cleveland.**

The $300,000 building, to be located in Walton Hills Village near the junction of the Ohio Turnpike and the North South Freeway presently under construction, will house sales and service activities of the company's materials handling division. It will serve industry in the Cleveland, Akron, Canton, Youngstown-Warren and Mansfield areas.



Kohler engines and electric plants, used in industry, construction, agriculture, and other fields, now are being manufactured in a new factory at **Kohler Co., Kohler, Wis.**

The new building, designed solely for production of engines and electric plants, is a single-story brick structure providing more than 12 acres of floor space. It has been under construction since June, 1959. Designed for straight line production, it concentrates machining, assembly and warehousing operations on one floor, a major improvement over the former five-floor operation. Purchased and machined parts are readily accessible. Enough materials for a day's run are stocked in each assembly area.

For More Facts About Ad on Facing Page Write in No. 289→



Clean

...that's *stainless steel*

Stainless Steel is the spotless metal for preparing the food you eat and serve. In protecting the health of your family there is no substitute for clean, corrosion-resistant Stainless Steel.

Look for the **STEELMARK** on the products you buy.

McLouth Steel Corporation,
Detroit 17, Michigan

Manufacturers of high quality Stainless and Carbon Steels

McLOUTH STAINLESS STEEL

NEW Turn-Towl cabinet can't ever rust...it's polished aluminum!

"Biggest economy news since the Turn-Towl itself!"





You're looking at the first anodized aluminum cabinet on the market and its built-in advantages: no rust, wear, finger marks — easy to clean.

Thoroughly tested for two years, this polished aluminum Turn-Towl cabinet combines new durability and service with the proven towel control. For the name of your nearest distributor, write Dept. 1100.

MOSINEE Sulphate Towels

BAY WEST PAPER CO.
GREEN BAY • WISCONSIN
Subsidiary of Mosinee Paper Mills Co.

Mosinee Turn-Towl cabinets are leased free for use with Mosinee towels

For More Facts Write No. 290 on Information Card—Page 32

Industry

(*Continued from page* 176)

Cutler-Hammer Inc., has begun operations in its new plant in the Belmont industrial area, **San Francisco.** The plant, which contains more than 35,000 square feet of floor space, houses the company's manufacturing, sales office and warehouse activities. It produces motor control lines and power distribution equipment.

A new corrugated container plant of the packaging division of **Olin Mathieson Chemical Corp.** in **St. Louis** has started operations. The 38,000 square foot plant has a production capacity of 25,000,000 square feet of corrugated containers a year. A fully equipped container design laboratory will aid in developing new or modified packages for Olin customers.

During the past year and a half, the Packaging Division has opened container plants in Dallas; Owosso, Mich.; Cincinnati; Joliet, Ill.; and Kansas City, Kans.



24 TYPES of EQUIPMENT

This handy reference describes Lewis-Shepard's complete line of "manually-operated," "intermediate" and "all-electric" equipment. Here is everything you need for a fully-integrated materials handling system. Write today for your free copy of L-S Condensed Catalog 80-204.

L-S® LEWIS-SHEPARD®

6712 Walnut Street, Watertown 72, Mass.

For More Facts Write No. 291 on Information Card—Page 32

Let SUN SHIP solve your machine problem

When you need machine work or specially built machinery of any kind, you'll find Sun Ship qualified to do the job exactly to your specifications. We have machine tools of every size, and the facilities and skills born of long experience.

When you have a machining problem, write or phone

SALES ENGINEERING DEPARTMENT

Sun SHIPBUILDING & DRY DOCK COMPANY
CHESTER, PA.

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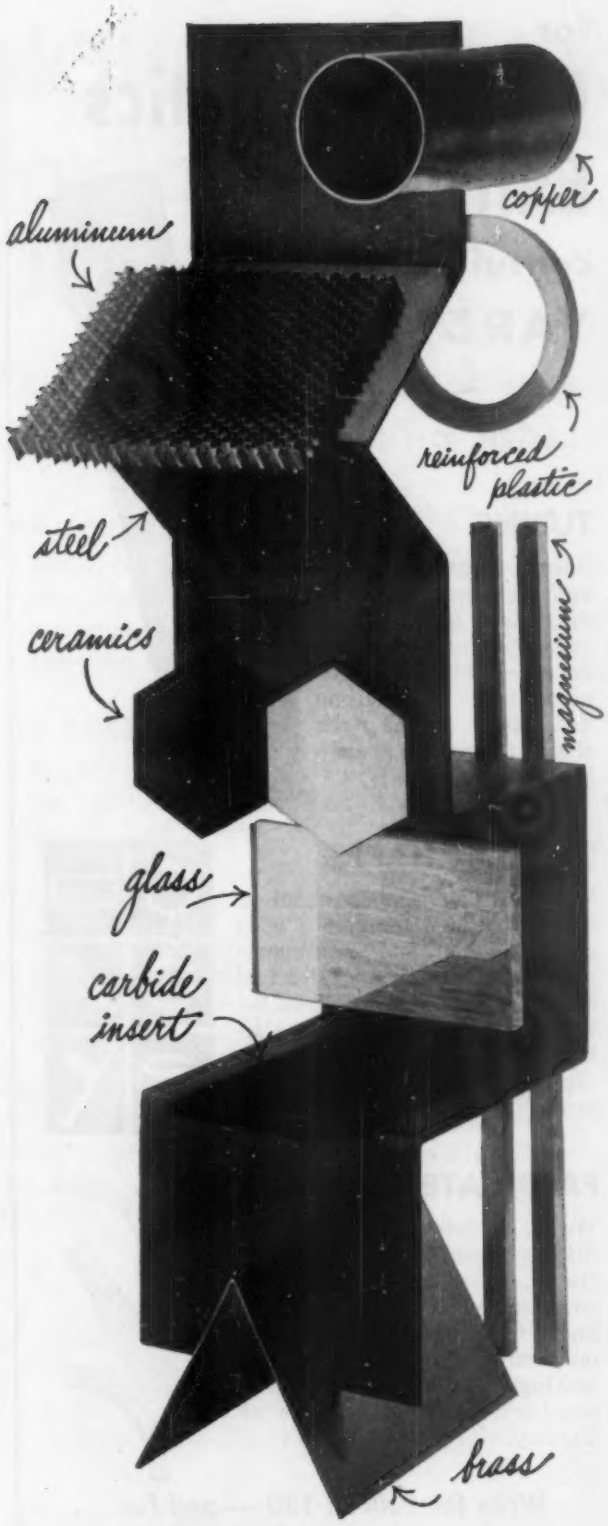
WHAT DO YOU WANT TO BOND TO WHAT?

Take a structural material—for instance, any of the materials shown to the right. Want to join it to itself or another material? Then chances are that SCOTCH-WELD® Brand Structural Adhesives are your best fabricating answer. This modern high strength method of joining materials permits improved design and production techniques . . . cuts costs . . . offers unique benefits.

For example: Smoother contours result when mechanical fasteners are eliminated. Fabricating complex shapes—often impossible or too expensive with ordinary fastenings—is made easy and economical with SCOTCH-WELD Adhesives. In fact, costly complex castings can often be replaced by two or more inexpensive simple castings bonded together with SCOTCH-WELD Adhesives. And lighter gage materials may be used where desired, since stress is spread over a wide area. Often, too, inspection and production steps can be eliminated. Another benefit—unusual combinations of materials which can be joined in no other way can be bonded perfectly with SCOTCH-WELD Adhesives.

Throughout the metalworking industry, bonding with SCOTCH-WELD Brand Structural Adhesives is improving quality, speeding production and cutting costs.

SCOTCH-WELD Adhesives may be the answer to your design and production problems . . . and improve your product at the same time. For full information write on your company letterhead, outlining area of interest, to: AC&S Division, 3M Company, Dept. SBCC-120, St. Paul 6, Minn. "SCOTCH-WELD" is a Reg. T.M. of 3M Co.



ADHESIVES, COATINGS AND SEALERS DIVISION

MINNESOTA MINING AND MANUFACTURING COMPANY

. . . WHERE RESEARCH IS THE KEY TO TOMORROW

3M COMPANY

For More Facts Write No. 293 on Information Card—Page 32

for

Custom Plastics Extrusions

consult

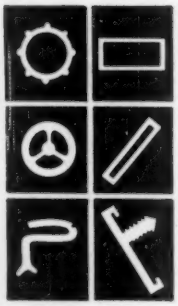
YARDLEY



TUBING

Special shapes or standard, rigid or flexible, in diameters from ½" to 16". Our engineers have developed advanced techniques that can save time and money on the right shape for your specific needs.

SPECIAL SHAPES



We extrude any shape in a variety of formulations to meet a wide range of design and performance requirements. Our complete tool and die shop is staffed with skilled technicians. We maintain a library of more than 400 section dies, one of which may fit your product design.

FABRICATED PARTS



We shape, flatten, curve, swedge, drill and perform other fabricating operations to make plastic parts ready for your production lines. Close tolerance, absolute uniformity, dimensional stability and high-gloss finish are standard production requirements at Yardley.

Write for Bulletin 180 — and for prompt quotation send us your prints

YARDLEY PLASTICS CO.

140-144 PARSONS AVE., COLUMBUS 15, OHIO

For More Facts Write No. 294 on Information Card—Page 32

The Economy: Which Way Are We Headed?

(Continued from page 77)

12 months ago, you have to bear in mind that in terms of population the market itself gets bigger each month:

Population in September	1960	181,085,000
"	1959	177,374,000
	Gain	3,711,000—2.1%

So, if your sales volume is up 2.1% you've held your market position in terms of population growth. Then there's something else you have to allow for—a change in the buying power of the dollar. This change isn't always downward. In terms of wholesale prices, the dollar in September '60 bought more than in September '59:

Purchasing Power of the Dollar

Wholesale prices ('47-'49=100)

September	1960	83.9¢
"	1959	83.5¢

But the buying power of the dollar in terms of consumer prices continues downward:

August 1960	79.0¢
August 1959	80.1¢

A falling off in any field is almost instantly reflected in employment. September 1960 was probably the greatest 9th month in America's history in employment. However, the report for October is less encouraging. Employment totaled 67,490,000 in October—the highest on record for that month—but was 277,000 less than in September. An increase of 400,000 would have been more in line with the usual September-October trend.

The report on unemployment is likewise not too encouraging. In October unemployment jumped to 6.4%—the highest it has been since the end of the 1957-58 recession.

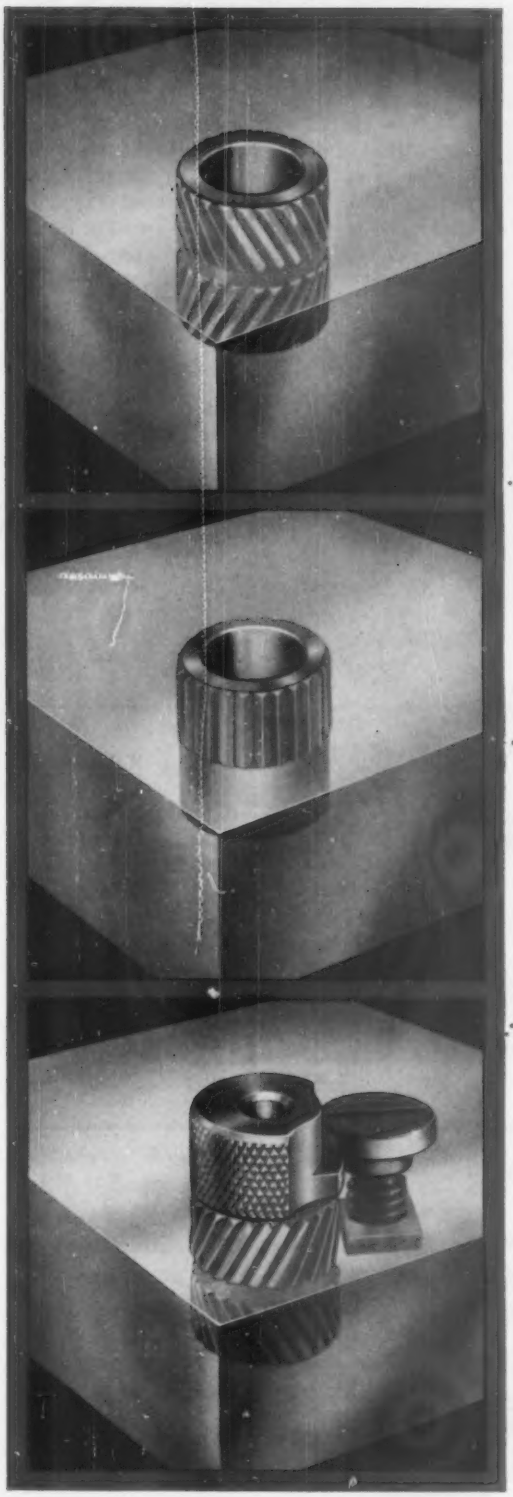
If you are looking for other signs to worry about, you can read danger in the expansion in consumer credit. It was $53.93 billion in August '60 compared with $48.84 billion in August '59—a close to 10% rise. Or you can ponder on the 29% drop in house starts in Sept. '60 compared with Sept. '59.

But if you're neither an optimist or pessimist, and keep an eye on all the dials that measure the pace of business in this complex country of ours, it's hard at the moment to find grounds for alarm.

In the foregoing we've steered clear of forecasts. You can get any kind you want. But here is just one—from a presumably highly informed source:

A group of private economists, among them the best in the business, prepared a report for the recent meeting of the Business Advisory Council in Hot Springs, predicting that GNP will rise to an annual rate of $508 billion by the end of 1960.

If they are right, that will be another all-time peak. They are optimistic as regards '61 too. They believe the $508 billion rate will be maintained for the first half of '61 and will hit $520 billion before the '61 year end. ► END



NOW in STOCK for Immediate Delivery...

Ex-Cell-O Drill Jig Bushings for All Plastic Tooling Jobs!

FOR 'POTTING'...

Ex-Cell-O Trans-Lok Bushings have exclusive herringbone knurl and annular groove design for maximum security in potted-type jigs, fixtures and templets. Bushings can't twist or pull out.

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Ex-Cell-O Press-Lok Bushings have straight knurls for greater gripping power when pressed into plastic, wood or other ductile materials.

FOR RENEWABLE BUSHINGS, TOO...

Ex-Cell-O Trans-Lok Liners, with the same deep transverse ridges as Trans-Lok Bushings, permit drilling or reaming using standard fixed-renewable or slip-renewable bushings.

Made of high chrome, high carbon oil-hardening bearing steel, Ex-Cell-O Bushings for plastics have uniform hardness, 62-64 Rockwell C precision ground diameters, and conform to A.S.A. standards and Ex-Cell-O's own high standards for quality.

Send today for catalogs covering Ex-Cell-O's complete line of bushings for plastics and metal or order direct from stocks in Detroit or Downey, Cal.

60-70

EX-CELL-O FOR PRECISION

PRECISION MACHINE TOOLS • GRINDING AND BORING SPINDLES • CUTTING TOOLS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • TORQUE ACTUATORS • CONTOUR PROJECTORS • GAGES AND GAGING EQUIPMENT • GRANITE SURFACE PLATES • COMPUTER PRODUCTS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • ATOMIC ENERGY EQUIPMENT • DAIRY AND OTHER PACKAGING EQUIPMENT

Precision Parts Division

EX-CELL-O CORPORATION
DETROIT 32, MICHIGAN

For More Facts Write No. 295 on Information Card—Page 32

Washington. Doner will ship fewer values for Egger and Carter by subtracting the $8.50 from their cost of shipments to Atlanta. Carter's column value can then be subtracted from the cost of shipping reels to San Francisco and Portland and row values will be established for those destinations. All other values, referred to as artificial Matrix Table values, can be computed by adding the row value to the column value for each point where a shipment could possibly be made.

The Cost Of Not Shipping

When the table is completely developed, we compare it with our original delivered cost table (see table 1). Any of the artificial Matrix values which are higher than corresponding delivered costs represent routes where shipments can be scheduled to effect a lower over-all cost. In this case, the Matrix table values exceed delivered costs for shipments from Egger and Carter to Nashville, St. Louis and Denver. The differences represent the cost of not shipping to these points and they are noted in table 6.

Naturally, our first adjustment will be made where the difference in cost is greatest, so we will arrange a shipment from Carter to Denver. To make our adjustment we insert a +x under Carter at Denver on our first shipping pattern, shown in Table 7, to indicate that we want to add x number of reels at that point. However, because we are adding x reels to the already filled requirements at Denver as well as adding x reels to Carter's already filled allocations, reductions must, of course, be made on shipments to some of the other plants.

To make these adjustments, first star each shipment which stands alone in column or row. In this case, the shipments affected are Allen to Boston, Syracuse and Nashville, Egger to Atlanta and Carter to San Francisco and Portland (+x entered at Denver is considered a number; therefore, the 250 reels from Allen to Denver are not starred). All shipments which are not starred will be adjusted.

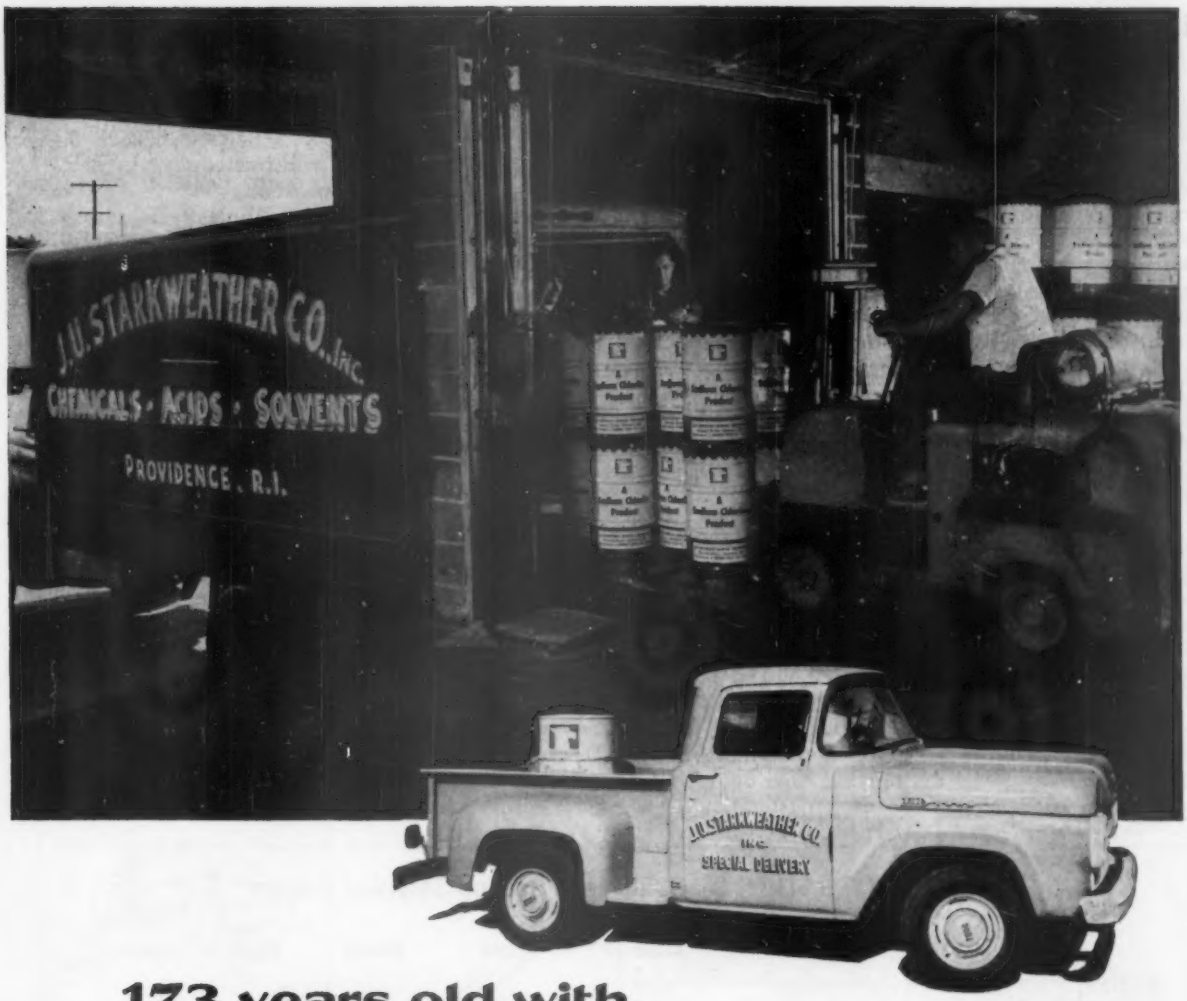
(Please turn to page 184)

TABLE 8—ITERATION 2—Second Shipping Pattern

	Rqts. (in Reels)	Allen	Bruce	Doner	Egger	Carter
Boston	620	620				
Syracuse	310	310				
Washington	1,105		752	353		
Atlanta	770			322	448	
Nashville	595	595				
St. Louis	485	117	368			
Denver	250	153				97
San Francisco	250					250
Portland	100					100
Total	4,485	1,795	1,120	675	448	447

TABLE 9 — SECOND MATRIX TABLE

	Allen	Bruce	Doner	Egger	Carter	Row Value
Boston	299.50	300.10	302.60	316.70	317.15	— .50
Syracuse	303.35	303.95	306.45	320.55	321.00	3.35
Washington	305.30	305.90	308.40	322.50	322.95	5.30
Atlanta	308.50	309.10	311.60	325.70	326.15	8.50
Nashville	310.40	311.00	313.50	4.55 327.60	328.05	10.40
St. Louis	308.95	309.55	312.05	1.25 326.15	326.60	8.95
Denver	321.15	321.75	324.25	11.50 338.35	338.80	21.15
San Francisco	305.95	306.55	309.05	323.15	323.60	5.95
Portland	313.25	313.85	316.35	330.45	330.90	13.25
Column Value	300.00	300.60	303.10	317.20	317.65	



173 years old with young ideas on service

From its modern Providence, Rhode Island, headquarters, J. U. Starkweather Co., Inc., serves all of New England . . . gives hundreds of customers unparalleled service and supply. An example of the emphasis placed on prompt service is the fact that Starkweather offers its customers a special ONE HOUR service anywhere within a 25-mile area. A "special delivery" truck stands ready day and night assuring a speed of service impossible for most suppliers to match.

J. U. Starkweather Co., Inc., is certainly one of the nation's oldest and most experienced chemical suppliers. When Ephraim Starkweather founded the business in 1787, he little dreamed that 173 years later the firm bearing his name would still be making important contributions to the chemical process industries of his native New England.

Customers of J. U. Starkweather Co., Inc., appreciate the benefits of dealing with a good chemical distributor. If you are interested in such service on Mathieson chemicals, we will be glad to suggest distributors in your own area.

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Since Denver is to receive x additional reels from Carter, it is apparent that x reels must be deducted from Allen's shipment to Denver. The only other figure which can be adjusted in the Allen column is at St. Louis in order to fill Allen's contract allocation. Since Bruce is the only other supplier scheduled to ship to St. Louis and we must maintain the requirement level for St. Louis, the reels for Allen are taken from Bruce's shipment to St. Louis. Bruce must now be increased to meet its allocation. Therefore, we must add x reels to Washington's shipment from Bruce and these are taken from Doner to meet its allocations. Doner is scheduled to send x additional reels to Atlanta and Carter sends x fewer reels to Atlanta. This completes our cycle as x reels have also been slotted for Denver from Carter.

We now evaluate x. If we selected an arbitrary number such as 300 to substitute for the minus x beside Allen's shipment to Denver, the net change would call for the impossible shipment by Allen of minus 50 reels. Therefore, we select the smallest shipment with a minus x assigned as the value of x. In this pattern, the smallest shipment is the 97 reels, scheduled from Carter to Atlanta. So we make x = 97, and form our second shipping pattern, shown in Table 8. We then determine the cost of this pattern by multiplying each delivered price from each supplier to each destination by the number of reels scheduled for shipment. Our total cost is $1,395,618 which is $3,089 less than the $1,398,707 cost the shipping pattern in Table 5. Each succeeding iteration will reduce costs further until we get a least cost solution.

The second Matrix Table (Table 9) is set-up in the same manner as the first. We again arbitrarily select $300 as the first column reference point. The row and column values are computed and then the artificial Matrix values. As you have probably noticed, the column values for Carter and the row values for San Francisco and Portland have changed.

Adjust Shipping Pattern

This time our comparison with the delivered cost table revealed only 3 matrix table values which exceed the corresponding delivered costs. The greatest difference, $11.50, appears under Egger at Denver. In Table 10, therefore, a +x is inserted in our shipping pattern, representing a shipment of reels from Egger to Denver.

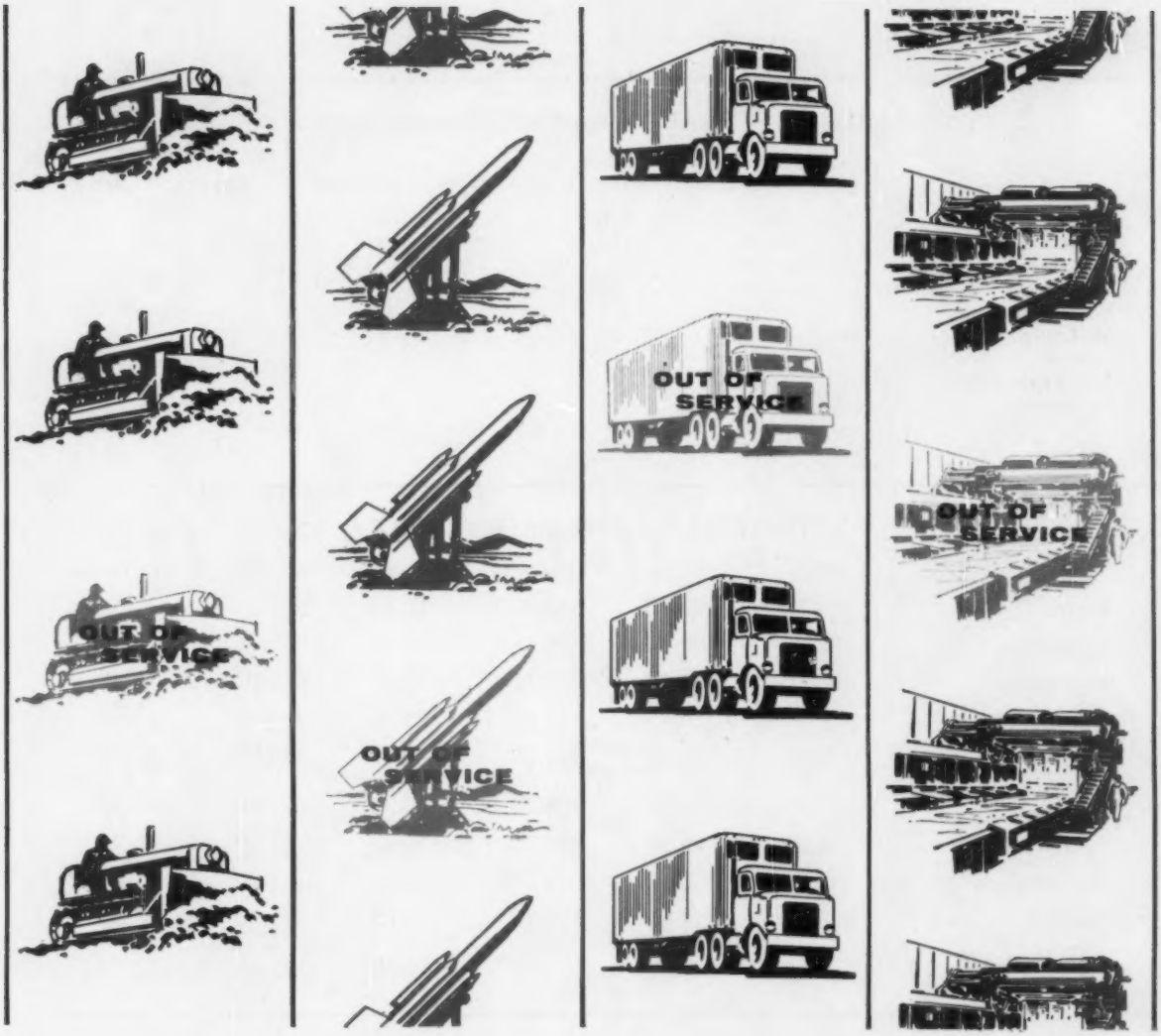
As before, the shipping pattern will have to be adjusted to keep all the allocations and requirements in balance. Allen will ship x fewer reels to Denver but x additional reels to St. Louis. Bruce's shipment to St. Louis will be smaller but more reels will be shipped from Bruce to*(Turn to p. 186)*

TABLE 10—ITERATION 2—Changes to Second Shipping Pattern

	Rqts. (in Reels)	Allen	Bruce	Doner	Egger	Carter
Boston	620	*620				
Syracuse	310	*310				
Washington	1,105		752+x	353−x		
Atlanta	770			322+x	448−x	
Nashville	595	*595				
St. Louis	485	117+x	368−x			
Denver	250	153−x			+x	*97
San Francisco	250					*250
Portland	100					*100
Total	4,485	1,795	1,120	675	448	447

TABLE II—ITERATION 3—Third Shipping Pattern

	Rqts. (in Reels)	Allen	Bruce	Doner	Egger	Carter
Boston	620	620				
Syracuse	310	310				
Washington	1,105		905	200		
Atlanta	770			475	295	
Nashville	595	595				
St. Louis	485	270	215			
Denver	250				153	97
San Francisco	250					250
Portland	100					100
Total	4,485	1,795	1,120	675	448	447



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TABLE 12—ITERATION 6—Sixth Shipping Pattern

	Rqts. (in Reels)	Allen	Bruce	Doner	Egger	Carter
Boston	620	620				
Syracuse	310	310				
Washington	1,105		1,105			
Atlanta	770	80	15	675		
Nashville	595	595				
St. Louis	485	190			295	
Denver	250				153	97
San Francisco	250					250
Portland	100					100
Total	4,485	1,795	1,120	675	448	447

TABLE 13 — SIXTH MATRIX TABLE

	Allen	Bruce	Doner	Egger	Carter	Row Value
Boston	299.50	299.10	300.30	310.45	322.40	— .50
Syracuse	303.35	302.95	304.15	314.30	326.25	3.35
Washington	306.30	305.90	307.10	317.25	329.20	6.30
Atlanta	310.80	310.40	311.60	321.75	333.70	10.80
Nashville	310.40	310.00	311.20	321.35	333.30	10.40
St. Louis	308.95	308.55	309.75	319.90	331.85	8.95
Denver	315.90	315.50	316.70	326.85	338.80	15.90
San Francisco	300.70	300.30	301.50	311.65	323.60	.70
Portland	308.00	307.60	308.80	318.95	330.90	8.00
Column Value	300.00	299.60	300.80	310.95	332.90	

reels to Washington but more to Atlanta. Egger's shipment to Atlanta will be smaller, but as mentioned before, Egger will also ship reels to Denver. This completes the new cycle.

X is evaluated as the smallest value with an assigned —x or 153. The adjustments will be made accordingly to complete the development of our third program (Table 11). We evaluate this solution and it costs $1,393,858 or $1760 less than our previous solution. We are making progress toward a final optimum solution. In this particular problem, the fourth program is $1,249 cheaper than the third, the fifth program $75 cheaper than the fourth. The sixth program shown in Table 12, is $316 cheaper than the fifth. We know that this sixth program is the optimum solution because our comparison (Table 13) reveals no Matrix table values larger than any corresponding cost in the delivered cost table (Table 1.)

The actual program, of course, involved 29 destinations and you can realize that the workings were much more extensive than in this illustration. It is significant to note that our final program is $6,489 more economocial than the first pattern established which as you recall had been established on a systematic basis.

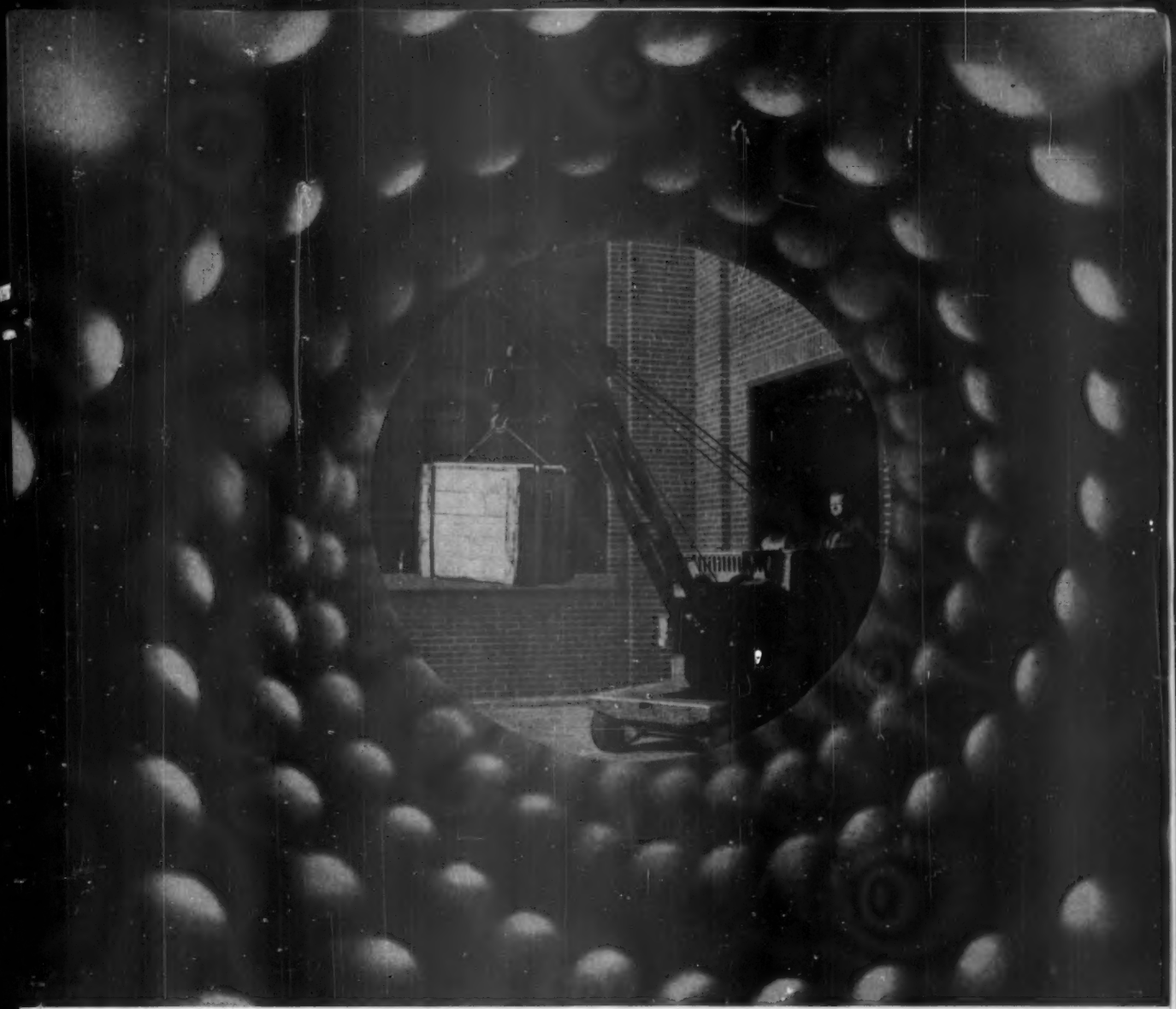
Although this final program provides an optimum solution, there may be alternate best solutions providing the buyer with greater flexibility. This particular program does not have an alternate but quite frequently our programs do. We know that whenever a final artificial matrix table value is the same as the delivered cost, an alternate solution can be developed with a shipment scheduled at that point.

You may have noted that requirements for some of the destination points are divided or "split" between suppliers. The Transportation Method of linear programming results in a number of splits equal to one less than the number of supplies. Without the Transportation Method more splits might have occurred resulting in higher costs for control, ordering, receiving, checking and handling.

It is not unusual to reduce the number of splits

(Please turn to page 188)

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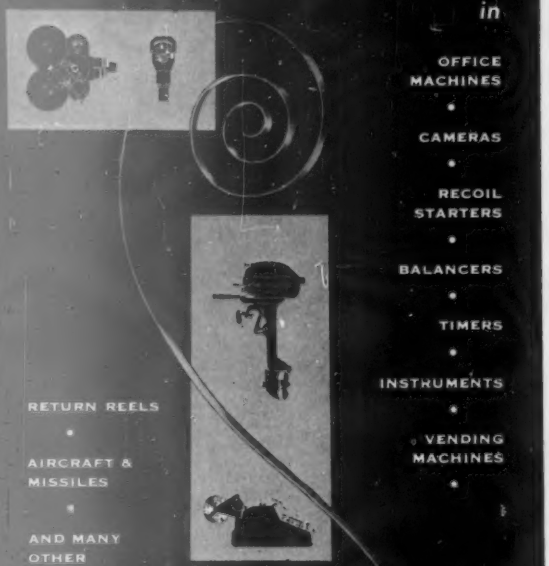
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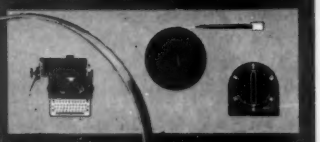
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Linear Programming

(*Continued from page* 186)

from 15 or 20 to 4 or 5. Our first program on Steel Strand is a good illustration of this. In Table 14, the x's indicate the shipping pattern before programming. In this case there were a total of 64 splits. The shaded areas show the pattern after programming when there are only 5 splits, one at Syracuse, Atlanta, Denver; two at New Orleans.

TABLE 14—Steel Strand Shipping Pattern Before and After Linear Programming.

DISTRIBUTING HOUSES	SUPPLIERS A	B	C	D	E	F
BOSTON	X	X	X	X		
NEW HAVEN	X	X	X			
NEW YORK	X	X	X			
BROOKLYN	X	X	X	X		
SYRACUSE	X	X	X	X		
NEWARK	X	X	X			
PHILADELPHIA	X	X	X	X		
PITTSBURGH	X		X	X		
WASHINGTON	X		X	X		
ATLANTA	X		X			X
LOUISVILLE	X	X	X	X		X
JACKSONVILLE	X		X	X		
NEW ORLEANS	X	X	X	X		
DETROIT	X	X		X		
CLEVELAND	X		X	X		
CINCINNATI	X	X		X		
INDIANAPOLIS	X	X		X		
CHICAGO	X	X	X	X		
MILWAUKEE	X	X		X		
MINNEAPOLIS	X	X	X	X		
ST. LOUIS	X	X	X	X		
KANSAS CITY	X	X	X	X		
DALLAS	X	X	X	X		
HOUSTON	X		X	X		
DENVER	X	X	X	X	X	

LEGEND: X INDICATES PATTERN OF SHIPMENTS BEFORE PROGRAMMING
▨ INDICATES PATTERN OF SHIPMENTS AFTER PROGRAMMING

Unfortunately, linear programming brings problems that we haven't yet discussed. It takes time to make the analysis so buyers must often get quotations earlier than normal. Not only are the calculations themselves time consuming but it also requires considerable effort to calculate what requirements are from each destination and to make all freight rates and unit prices comparable for analysis. This can require elaborate calculations particularly when freight rates and shipping weights vary substantially.

A computer is very helpful in making linear programming calculations. In fact, in some of our larger programs, manual calculation just isn't practical. In one problem, for example, the matrix consisted of 928 rows and 5 columns. A total of 477 iterations was required (compared with six in our example in this article) to get a final solution. This would take months if done manually.

In many cases, it is not practical to follow the lowest cost solution indicated by linear programming. Strikes, shortages, changes in usage, and other factors all disrupt the pattern. Nevertheless, we believe that linear programming has reduced the cost of the items to which it has been applied by 3% even though it is not always possible to follow the optimum cost shipping pattern indicated by the program. ► END

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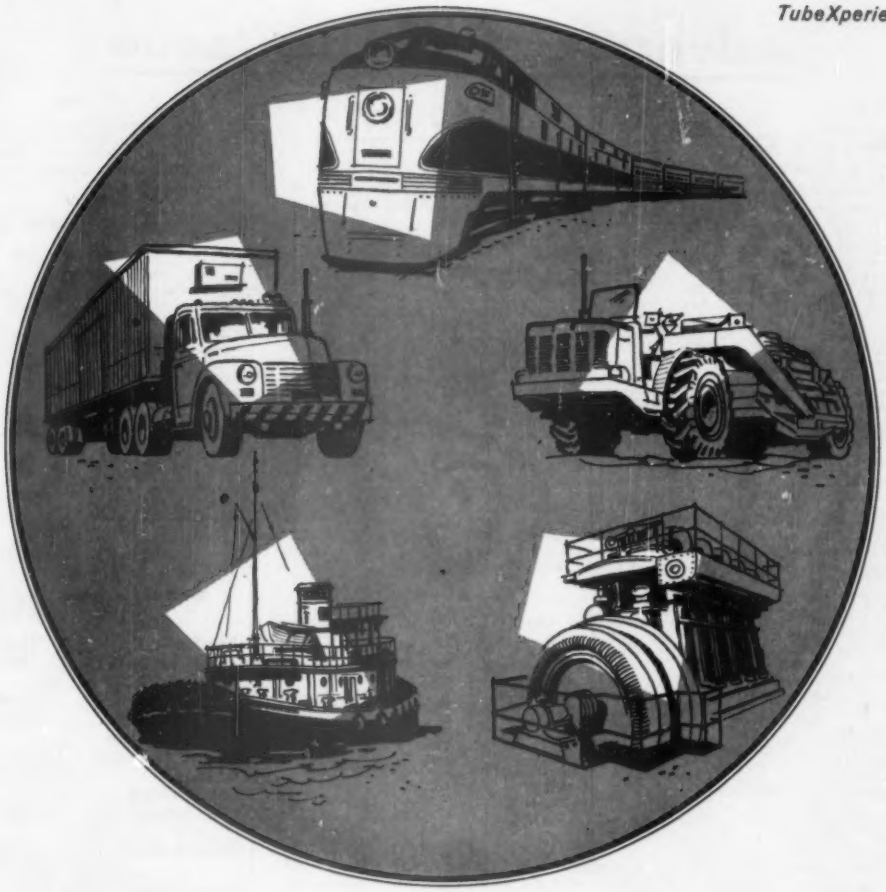
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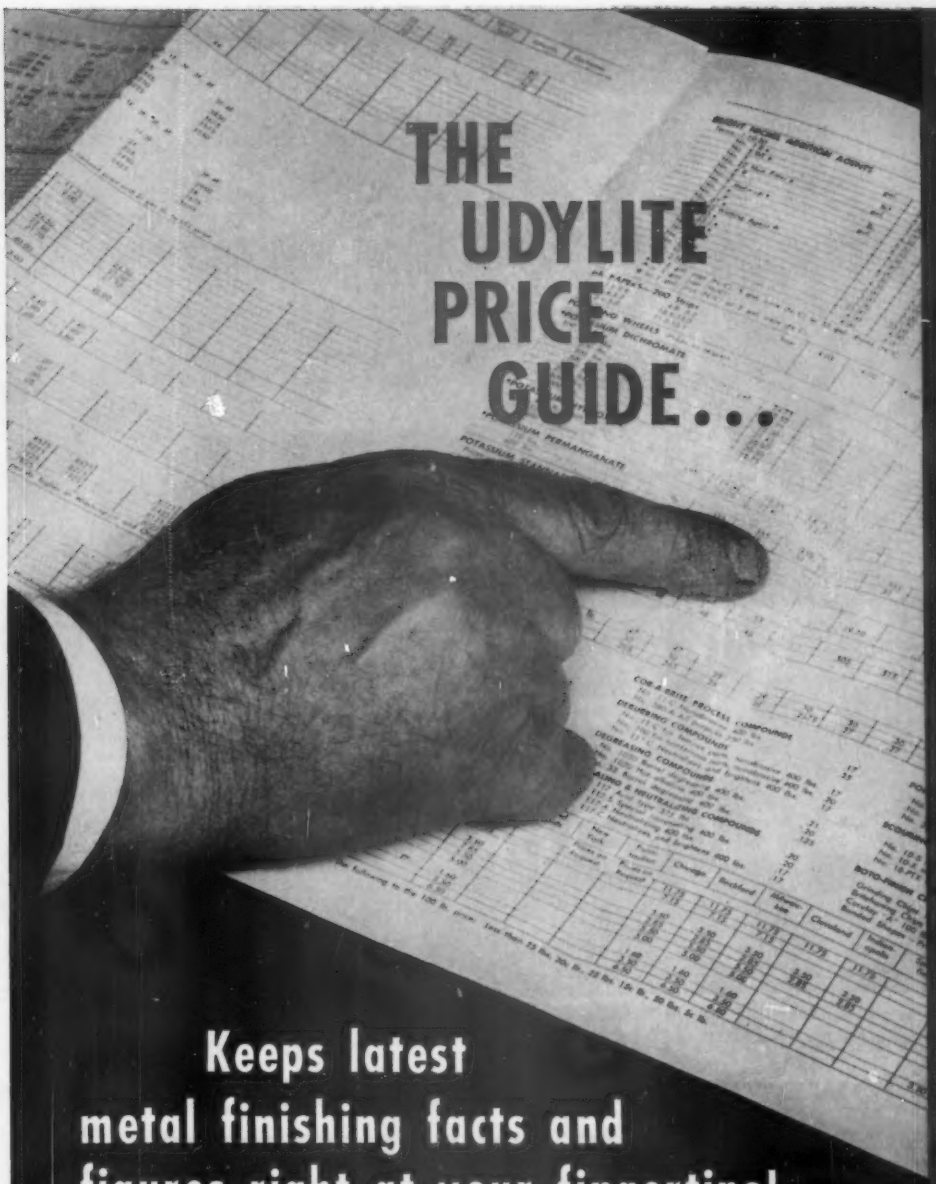
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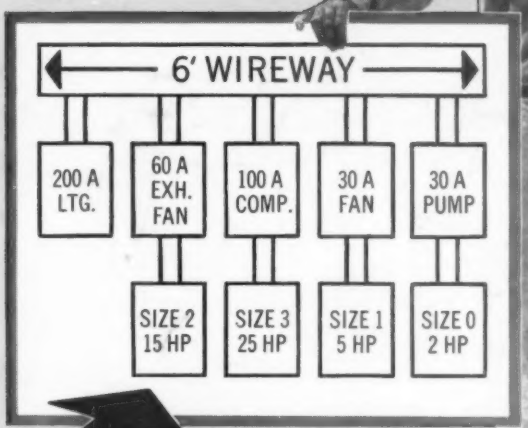
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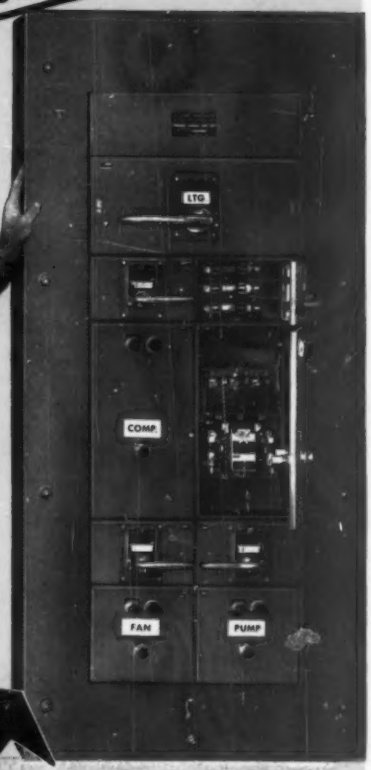
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STARTERS IN QMB PANELBOARDS!

ANOTHER SQUARE D FIRST!



IT TAKES
41 HOURS AND 6 FEET
OF WALL SPACE TO INSTALL AND WIRE SWITCHES AND STARTERS LIKE THIS



IT TAKES
12 HOURS AND 30 INCHES
OF WALL SPACE FOR THE SAME INSTALLATION WITH A QMB STARTER PANELBOARD

QMB MEANS LESS TIME AND LESS SPACE PLUS

- **LOWER COST** • Time is money. The overall cost of QMB motor starters is usually less than that of separately installed starters and switches.
- **PLUG-IN FLEXIBILITY** • Plug-in switches and starters can be removed and installed in minutes. Minor circuit changes can be made without costly down time. Components easily rearranged if processes change.
- **ADDED SAFETY** • Interlocking prohibits opening starter or switch doors when switch is "ON."

QMB panelboards accommodate reversing and non-reversing starters, sizes 0 through 4. QMB switchboards and unit substations handle sizes 0 through 5. Part winding and two-speed starters available on order. All components available factory-assembled and wired. Enclosures, starters and plug-in switch units are also stocked by your Square D distributor for on-the-job assembly.



Notice how the PLUG-IN switch unit is mounted directly above the starter, permitting interlocking. The starter cannot be opened when the switch is in the "ON" position.

It's easy to order these starter and switch units. See your latest Square D Digest for further information.

SQUARE D COMPANY

wherever electricity is distributed and controlled

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